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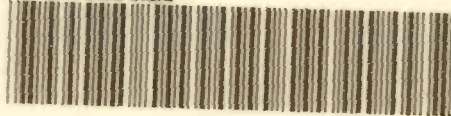
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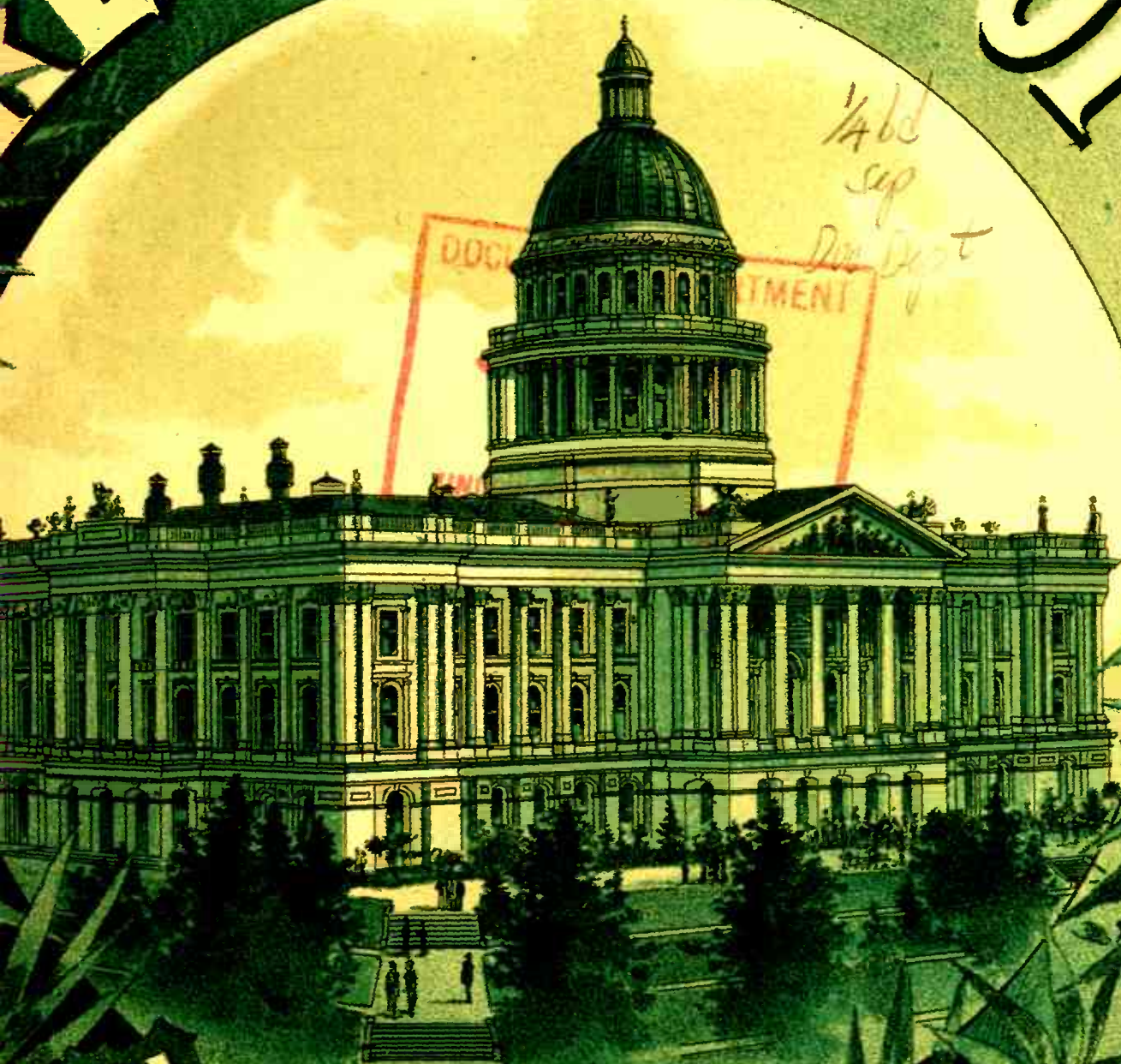


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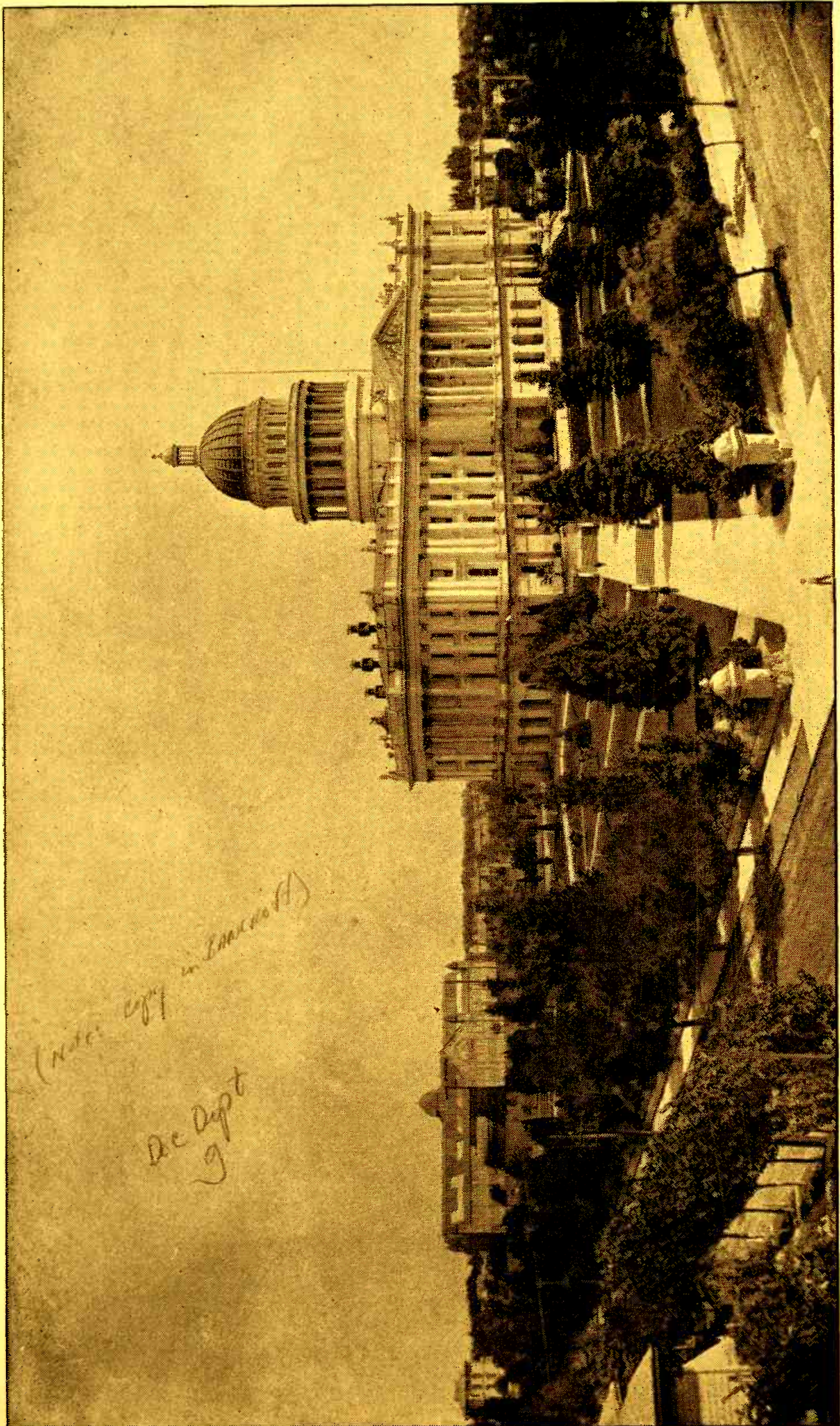
RESOURCES OF



CALIFORNIA

PREPARED BY
AUTHORITY OF LAW

H. H. MARKHAM, GOVERNOR.



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STATE CAPITOL AND GROUNDS. (The State Printing Office and Agricultural Pavilion in the distance.)

Calif Governor

RESOURCES

OF

CALIFORNIA

PREPARED IN CONFORMITY WITH A LAW APPROVED MARCH 11, 1893.

BY

H. H. MARKHAM, GOVERNOR.



SACRAMENTO:

STATE OFFICE, : : : : A. J. JOHNSTON, SUPT. STATE PRINTING.

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This book was prepared in accordance with suggestions to the Governor by the executive committee of the Press Association of California. As editor, I am responsible for the description of the counties. The various articles were prepared by gentlemen whose acquaintance with the subjects upon which they respectively wrote, gives assurance of the correctness of every statement made.

Owing to lack of space many subjects had to be omitted; such as lumbering, stock raising, hops, fish, manufactories, and pursuits common to other States. Only such industries, except agriculture, were selected as are peculiar to California.

We are indebted to the following persons for valuable data relating to their respective counties: James McCauley, of Amador County; Watson Chalmers and N. G. Smith, Butte; C. M. Whitlock, Calaveras; J. E. Eldridge and L. W. Musick, Del Norte; G. M. Richardson, El Dorado; S. H. Cole, Fresno; W. A. Chalfant, Inyo; John Isaac, Kern; W. L. Rideout, Lake; Harry Brooks, Los Angeles; L. B. Woodruff, Merced; J. Buckingham, Mendocino; Mrs. Frances A. Reynolds, Mariposa; W. W. McMillan and E. W. Wilson, Modoc; F. E. Wadsworth, Nevada; J. M. Francis, Napa; W. S. Taylor, Orange; W. H. Schardin, Placer; A. J. Waterhouse, San Joaquin; A. B. Lemon, Sonoma; A. Dalton, Solano; Strong & Arms, San Diego; S. W. Bugbee and J. C. Quimby, San Francisco; D. McPherson, Santa Cruz; Edwin Rhodes, San Bernardino; H. C. Wright and Myron Angel, San Luis Obispo; Chas. Tracie, Shasta; R. Nixon and G. D. Cummings, Siskiyou; M. Pritchard, Sierra; N. B. Kirtley and A. D. Cutts, Sutter; Benj. Maddox, Tulare; Ed. E. Leake, Yolo; and T. J. Sherwood, Yuba.

The Governor desires, sincerely, to thank the writers of the various articles and the above named persons for their contributions.

E. W. MASLIN, Editor.

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INTRODUCTION.

EXECUTIVE DEPARTMENT,
SACRAMENTO, CALIFORNIA. }

The Legislature of the State of California, at its last session, passed an Act which provides that "the Governor is authorized and empowered to prepare, or have prepared, a volume expository of the resources of the State of California, for the purpose of distribution at the World's Columbian Exposition."

The present volume is issued in compliance with such law. According to the best advice which I could obtain, it was thought best to present a succinct description of each county, which should include such an account of its area, population, chief industry of the inhabitants, climate and soils, as would assist the intending settler, before leaving his home in the East for California, in forming his judgment as to which part of the State offered immediate advantages in the pursuit of the vocation he chose to follow.

It is impossible, with the limited appropriation made, having in view the necessity of a large edition of the work, to present, even in the briefest form, a statement of *all* the resources of the State, which are boundless.

In no State do so many opportunities offer to engage the energies of man. The Sierra Nevada Mountains contain a belt, situated in the most enjoyable climate in the world, which for 400 miles in length is fairly reticulated with gold-bearing quartz lodes open to free exploitation. The State abounds in nearly every known mineral. The soils of the valleys and mountains are adapted to the growth of fruits of sub-tropical and temperate zones. The waters of thirty-four streams flow from varying altitudes in the mountains to the plains below, ready to supply illimitable power by that most potent agency, electricity, to mechanical and manufacturing operations. The task of presenting even a resumé of our resources being inexpedient, it was thought best to direct attention to the present and most important fields of industry, believing that for many years to come they will offer ample opportunity for the investment of capital and the expenditure of the best and most profitable industrial energies. There has been no attempt at mere literary display. The effort has been in the direction of marshaling facts, from which the reader may draw his own conclusions. The various subjects have been treated by gentlemen of State-wide reputation, each of whom is especially fitted by experience and learning to write upon the matter submitted to him.

I selected as the editor Mr. E. W. Maslin, Secretary of the California State Board of Trade, a gentleman whose office and practical experience fitted him for the task, and all the statements made have been verified by him. There has been no exaggeration. The gentlemen whose pens were engaged in this work were impressed with the importance that nothing should they extenuate nor set down aught but plain, unvarnished facts.

I believe that more harm than good has been done by the stories of exuberant vegetable growths and wonderful yields of grain and fruit. It is true that a prune tree has yielded 1,100 pounds of fruit, and that an acre of land has produced 18 tons of grapes, but it is not true of the average tree or vine. The Californian believes these statements, because they are common enough in this State to cause no surprise; but when such statements are sent to the East, they are apt to be so made as to induce the belief that such yields are common and may be relied upon. The truth about California is enough to be told.

More attention has been given to horticulture than to any other branch of industry, because it is destined to be the basic industry of the State, and because it is most attractive to intelligent minds. It has the confidence of the people of the State as the

more certain in its results, both for profit and contentment, than any other vocation. It is estimated that last year the enormous crop of fruit did not reach more than five million people. Imagine the draught upon our energies when the facilities and cheapness of transportation are such that every person in the United States, even if the population does not increase, may be able to obtain our fruit. In 1880 not more than 500 carloads of fruit were shipped East from this State, yet in 1892 we shipped from the State by sea and rail, 20,495 carloads of fruits and nuts. There was transported by rail, in pounds, of green fruit, 111,688,690; citrus fruits, 69,715,000; dried fruits, 58,735,980; raisins, 53,113,320; canned fruits, 77,555,820; a total of 374,826,050 pounds. Estimating the pounds of green fruit to make one of dried, we have 715,996,610 pounds. Add to this 35,091,216 pounds shipped by sea, and we have the total amount shipped from the State, 751,087,826 pounds.

Horticulture offers the most certain and immediate returns for the labor bestowed, and is the most inviting field for the man of moderate means. In agriculture, simple, even in this State, the acreage unit is increasing and the number of owners lessening. We are solving the problem in California. The unit of the orchard and vineyard holdings is 20 or 40 acres. Imagine the influences which must flow from this close contact of neighbors when horticulture shall become the dominant industry. All social, religious, and educational advantages may be enjoyed which pertains to cities. The culture of the country will in nowise be distinguished from that of the city. The tide of settlement will be turned, and is now turning, from the cities to the country. The question so often asked by the anxious father and mother in the East, "What shall I do with my boy?" will occasion no solicitude here. The dull repose of mere agricultural life, and the absence of social enjoyments, repels the boy from the farm, but the pursuit of horticulture will awaken all his energies and be an intellectual stimulus to his mind. He may here associate with the most intelligent and cultured people, who find delight and profit in its pursuit.

What the State is doing to foster various industries may be evidenced by her appropriations. There was an annual appropriation by the last Legislature as follows: For agricultural societies, \$115,000; citrus fairs, \$5,000; horticulture, \$14,800; viticulture, \$15,000; and mining and geological work, \$25,000. The State and the Stanford Universities each has departments of agriculture, horticulture, and mining.

There is a want of knowledge in the East in respect to irrigation. It is resorted to in this State in accordance with the views of growers. In some sections even for citrus fruits it is imperative; in other sections fruit may be raised without irrigation. Perhaps in the largest part of the fruit sections irrigation is not a necessity. That it is a factor in producing large crops is not denied, but it is not generally a necessity. In the San Joaquin Valley and in Southern California water is a necessity and the supply at present is ample.

The question may be asked, Why this book? I answer frankly, Because the State needs more population. California has 158,360 square miles, or 101,350,400 acres. There are about 33,500,000 acres of arable land in the State, the San Joaquin Valley having 6,850,000 acres, the Sacramento Valley 5,600,000 acres, and the foothills of the mountains 6,000,000. The population, by the census, is 1,208,130. We want our soil tilled, our mines opened, our rivers improved. We want the touch of the elbow of enterprising men and women in our progress. We want more homes, schools, and churches.

This book is accompanied with an invitation to the sturdy young men of the Union to come to California. There is room here for you, and a generous welcome.

I close this with the closing paragraph of an article written by me for a paper to be distributed at the World's Fair:

"I hope that our exhibit at the World's Fair will be carefully examined, and all the economic questions in connection with each class thoroughly investigated by every visitor there, for I believe that within ten years our increase in wealth and prosperity will be marvelous, and I have no hesitation in recommending Eastern people to come here to invest money, to seek health and pleasure, or to earn a living and build up a profitable business."

H. H. MARKHAM,
Governor.

CALIFORNIA.

DESCRIPTION OF THE COUNTIES OF THE STATE.

ALAMEDA.

Alameda County is bounded north by Contra Costa County, east by San Joaquin, south by Santa Clara, and west by bay of San Francisco.

Statistics.—Area, 737 square miles, or 512,000 acres. Lands assessed, 448,319 acres. Total assessed valuation of all property, \$90,999,497. Rate of taxation, State and county, 1.10. Number of miles of railroad, 130; assessed at \$1,993,856. County property, \$785,000. County debt, \$46,425. Number of schools, 362. School children between 5 and 17 years, 25,052. School money, \$618,209 86. Population, by census of 1890, 93,516.

County Seat and Principal Towns.—Oakland is the county seat; population, 60,000; school children in 1893, 13,617. The principal cities and towns are: Alameda, population 12,000; Berkeley, population 8,000; Haywards, population 1,500; Livermore, population 1,400; San Leandro, Niles, Pleasanton, Irvington, Mission San José, Newark, Alvarado, San Lorenzo, and certain environs of Oakland, as Golden Gate, Lorin, Emeryville, and Stockyards.

Oakland has seven banks, City Hall, and City Library of 25,000 volumes, County Court-house and Hall of Records, 147 miles of legal streets (79 of which are asphalted or macadamized), 71 miles of sewer, 221 miles of sidewalks (one half of which is cement or artificial stone). It is lighted with gas and electricity, provided with fine water from three joint sources of supply, mainly Lake Chabot, has a magnificent theater, three daily newspapers, and eight others of lesser note. The Piedmont baths have a splendid building, and one of the best natatoriums in the country. The business blocks are substantial and expensive, and there are miles of elegant residences, surrounded with lawns, shrubbery, and flowers. Together with Berkeley and Alameda City it forms the educational center of the Pacific Coast, the location of elegant, luxurious, and refined homes, the center of attraction for investing capital, and in every respect has a most flattering future.

Alameda, equally accessible with Oakland and Berkeley from San Francisco, and equally attractive as a place of residence and business, embodies like advantages. Its population is about 12,000. It is supplied with pure water from artesian wells, by the Holly system, lighted with gas and electricity, well paved in streets and sidewalks, mild and tempered in climate, even more than Oakland, and has the best sewerage system possible to secure, with modern automatic sewer flushers. There are several banks, two daily newspapers, and many fine buildings.

Berkeley is also a city of fine homes for business men of San Francisco, and for retired capitalists, for men, women, and children seeking a healthful climate, best educational advantages, quiet life, proximity to a large city and all that this includes. It has between 8,000 and 9,000 population, and like the other places above named is growing rapidly. Its water is derived from tunnels in the hills back of the city, its gas from Oakland, and its electric lights from its own system. It has banks, newspapers, and all business facilities.

San Leandro, Haywards, and Livermore are lovely country towns, quiet, healthful, progressive, with banks, newspapers, and first-class hotels. All the intervening country, in fact, is lined with residences of business men from the city, engaged in fruit culture, or seeking rest, pure air, and tranquillity in their suburban homes.

Topography.—Alameda County skirts the bay of San Francisco for 36 miles. Between the bay on the west and the Contra Costa range on the east lies a tract of level land running from Berkeley on the north to a distance of over 30 miles south, being about 3 miles wide at Berkeley, and widening out in the south to 12 or 15 miles. On the north and east the county is broken by hills of the Contra Costa range, ranging from 400 or 500 feet high to peak of Mission San José, 2,273 feet high. Among and bordering on these hills are numerous smaller fertile valleys, the most important of which lie mainly in the southeastern part, and are known as Livermore, Moraga, Sunol, Castro, Amador, and Calaveras. Along the bay are a few salt marshes. The principal stream is Alameda Creek, rising in Mount Diablo range, near Livermore, and, running through a cañon in Contra Costa range, empties into San Francisco Bay near Alvarado. Also San Lorenzo Creek and San Leandro Creek, on which is located Lake Chabot, the chief source of Oakland's water supply. The eastern section of the county, in which Livermore Valley is located, is very hilly, and of much higher altitude generally, though interspersed with many small valleys.

Soils.—Along the bay shore and salt marshes the soils are heavy alluvium, and very fertile. Back of this is a broad belt of rich, black adobe, crossed at intervals by lighter sedimentary deposits. Around Niles the soil grows to lighter loam. In the numerous small valleys much of the same heavy character prevails, with like fertility and strength, varied by injections of sandy loam or small gravel.

Climate.—San Francisco, on the Golden Gate, is foggy and windy. Oakland and Berkeley, opposite and distant 6 or 7 miles, are far less so, because of distance, and because of coast hills elevating the winds and fogs, so that they pass over Oakland and Berkeley and strike the high hills lying east of them. As you travel south the influence of these winds and fogs gradually fades away, so that in Alameda City you find less, in East Oakland and Fruitvale still less, until at San Leandro and Haywards you have the most delightful summer and winter climate possible. At Niles it grows some warmer in summer. Livermore and Pleasanton, in the southeast, have an interior climate. Observations, 1891-92, at Oakland show mean temperatures: spring, 54.08°; summer, 62.03°; fall, 57.09°; winter, 53.10°; and average for eleven years past: spring, 55.29°; summer, 60.46°; fall, 56.72°; winter, 49.81°. Mean annual rainfall for eleven years past is 24.33 inches. Death rate for past ten years in Oakland, 13.57 per 1,000 population; Alameda City, 11 per 1,000 population.

Irrigation.—Little irrigation is resorted to, there being only one short canal of 5 miles. Fifty artesian wells are found in the county, mostly around Alvarado, in depth from 200 to 400 feet, now being exploited for domestic supply.

Agriculture.—About 213,000 acres are devoted to the various departments of agriculture—97,000 acres to hay, 68,000 to barley, 36,000 to wheat, and 12,250 to oats. Reported products for 1892 are 2,000,000 bushels of barley, 1,000,000 bushels of wheat, 500,000 tons of hay. Corn is principally in market gardening for the table. Cereals average from 30 to 50 bushels per acre. In vegetables, no other county surpasses Alameda. From East Oakland to Mission San José is one series of vegetable gardens. The products and shipments are enormous from the principal centers of San Leandro, San Lorenzo, Haywards, Niles, Mission San José, Irvington, and all stations on the narrow gauge nearer the bay. Peas, in April, May, and June, three to five cars a day; potatoes, cabbage, cauliflower, celery, squash, onions, beets, cucumbers, by the 50-acre field; tomatoes by the 100-acre patches. Rhubarb of finest quality is shipped at the rate of \$500 a day from San Leandro and vicinity. Hops are grown extensively around Livermore and Pleasanton.

Horticulture.—From East Oakland to Niles, Sunol, and Livermore is an almost uninterrupted series of orchards of deciduous fruits, vineyards, and berry gardens. Apricots lead in acreage, then in order succeed prunes, cherries, plums, pears, almonds, apples, nectarines, peaches, olives, English walnuts, and figs. Very little citrus fruit is grown. Immense amounts of raspberries, strawberries, gooseberries, and currants are raised. The illustrated album of Alameda County for 1893 gives the following number of fruit trees: Apricots, 331,000; prunes, 235,100; cherries, 227,100; plums, 185,500; pears, 170,100; almonds, 123,700; apples, 50,500; nectarines, 40,700; peach, 37,500; olives, 3,700; English walnuts, 3,600; figs, 2,300. The fruit shipments of 1892 are estimated at 3,250,000 pounds. The above examples sufficiently show the especial adaptation of the soil to varieties. Grape culture is largely engaged in at Livermore, Pleasanton, Sunol, Mis-

sion San José, in the hotter and drier regions, and on the sunny slopes. Seven thousand acres in vineyards are reported in 1892, and a wine product of 1,250,000 gallons. Out of four medals granted to American wines at the Paris Exposition, in 1889, three were carried off by Alameda County. The State Board of Horticulture's report for 1892 shows for the county, 16,404 acres of fruit trees—13,050 bearing and 3,354 not bearing.

Stock Raising and Dairying.—Though Alameda is not properly a stock-raising county, it has a large quantity of fine stock and makes much fine butter. The condition of this industry shows how advantageous is diversified farming, and how all the resources of the land and situation are utilized. If the whole State used its available resources in the same proportion as Alameda County, it would sustain a population larger than that of the island of Great Britain.

The Assessor's report for 1892, which certainly errs on the side of conservatism, shows 11,280 horses, 17,048 cattle, 2,000 hogs, 9,975 sheep, 100 goats, 35 mules, and 3,576 dozen poultry. All localities in the county raise their proportion of this product, though there are exceptionally fine stock farms around Pleasanton and Livermore.

Minerals and Timber.—The mineral and timber resources of the county are unimportant, with the exception of coal, of which there is an extensive field at the base of Mount Diablo, which has been mined for a number of years.

Educational Advantages.—The State University at Berkeley is located on a beautiful site of 245 acres, amidst natural trees, improved lawns and gardens, commanding an overlooking view of Golden Gate, San Francisco, Alameda, and Oakland, the bay, and the mountains of Marin County. It has twenty-two buildings on the grounds, including North and South Halls, Bacon Art and Library Building, Mining and Mechanical Arts, Agricultural, Chemical, with laboratory, Electrical buildings, etc. Its library contains 50,000 volumes. Its endowments amount to nearly \$7,000,000, of which \$4,053,824 57 is cash or income-producing. Its present student roll is 1,061, or 851 men and 210 women. It ranks fifth in endowment and seventh in number of students in the United States. No tuition is charged. The University also embraces the Lick Observatory at Mount Hamilton near San José, Colleges of Law, Medicine, Pharmacy, and Dentistry in San Francisco, and has recently had added to it by gift from the Mark Hopkins estate, the Hopkins mansion in San Francisco, to be devoted to a School of Fine Arts.

The State Asylum for Deaf, Dumb, and Blind at Berkeley, as much an educational institution as any other, is endowed by the State and has a splendid site for its buildings, on the same slope with the University, which consist of educational building with assembly hall, library, art gallery, and executive offices, refectory, gymnasium, home buildings, cooking schools, steam laundries, engine house, electric light plant, carpenter shops, printing office, orchards, kitchen, garden, and a fine herd of Holsteins and Jerseys. The combined attendance is about 200 for 1892. Warren Wilkinson is Principal.

Public Schools.—There are 362 public schools in the county, of which Oakland, Alameda, and Berkeley hold the major number. Oakland school property is valued at \$1,001,340; Alameda City, \$191,889; Berkeley, \$25,525; outside districts, \$284,924.

Private Schools.—Mills College for young ladies, in Brooklyn, 5 miles from Oakland; Washington College for boys and girls, at Irvington; Livermore College, at Livermore; in Oakland, Field Seminary, Snell Seminary, Hopkins Academy, Pacific Theological Seminary, California College at Highland Park, Christian Brothers College, and two business colleges.

Religious Institutions.—In Oakland there are 66 churches, representing many religious sects, all provided with more or less elegant places of worship. The other cities and towns are equally well provided.

Fraternal Societies.—About 27 fraternal societies are represented in the county, and have attractive places of meeting.

Charitable Institutions.—Aside from the County Infirmary and Hospital Buildings, located in Eden Township, between San Leandro and Haywards, there are numerous hospitals, homes, and charitable associations—mainly in Oakland, but in proportion also in the other cities of the county—such as Fabiola Hospital, Home for Adult Blind, Old Ladies' Home, and many others.

Manufactures.—Alameda County, especially Oakland, Alameda City, Berkeley, and their immediate environs, is largely a manufacturing center, embracing a wide range

and many very extensive institutions, such as salt, flour, iron products, bridges, leather, soap, nails, cars, smelted products, refined borax, tiles, pottery, brick (common and pressed), cotton, jute, canned fruits and vegetables, fruit boxes, coal oil, beet sugar, agricultural implements, moldings, sash, doors, blinds, paints, and oils. The Oakland outside stockyards turn off a yearly product of \$2,000,000. There are 98 manufactories in Oakland, and proportionately in the other cities. Ship building is extensively carried on in Oakland and Alameda. The Alvarado Beet Sugar Works turn out 50,000 pounds a day, and encourage extensive plantings of sugar beets at \$5 a ton, or about \$75 an acre. The yearly output of the Borax Refinery is 5,000 tons.

Railroads.—The Southern Pacific System receives and sends out 300 trains a day from Oakland center, including overland by Ogden, by Portland, by Los Angeles, south to San José, north to Napa, Sonoma, and Mendocino, local to San Leandro, Haywards, and Niles, Alameda half hourly each by two routes, Berkeley half hourly, and all Oakland front half hourly.

Street Cars.—The cities of Oakland and Berkeley are traversed by two cable lines and six electric lines, one of the latter running hourly to all points as far as Haywards, 20 miles.

Harbor and Waterfront.—Oakland and Alameda have many miles of waterfront. Two lines of ferry run each half hourly to San Francisco, time about twenty minutes. Several mixed passenger and freight boats also run, hourly or less frequently. A new ferry will soon be established at Emeryville, and the California and Nevada Railroad, sold lately to new parties, will be changed to broad gauge, extended to Walnut Creek, and possibly into the San Joaquin Valley, and give needed and healthy competition in freights and fares.

The improvements now making in Oakland harbor will stimulate wharf building and shipping business generally on this side of the bay. The Government has expended \$1,534,000 on the harbor, and will spend \$990,000 more. The tidal canal connecting San Leandro Bay with the Estuary will soon be completed, and many new wharves will be built.

Prices of Land.—Lands in this improved section range from \$250 to \$500 an acre. The more remote from the advantages and the higher up among the hills, the poorer the soil, the less the price.

You cannot go astray in Alameda County within these limits in seeking a home. It is not for the impecunious man, however; you must have capital, a business, something to fall back on. With these conditions you can nowhere live more happily than here.

ALPINE.

Alpine County is bounded north and east by the State of Nevada, east by Mono County, south and west by Inyo and Tuolumne Counties, and west and north by Calaveras, Amador, and El Dorado Counties.

Statistics.—Area, 836 square miles, or 535,000 acres. Unentered Government land, 300,000 acres. Lands assessed, 37,890 acres. Total assessed valuation of all property, \$269,494. Rate of taxation, State and county, 2.80. County property, \$1,600. County debt, \$21,642 25. Number of schools, 4. School children between 5 and 17 years, 105. School money, \$2,199 39. Population, census of 1890, 667.

County Seat.—Markleeville is the county seat, located on the west bank of Carson River, and reached by stage via Reno and Carson. It has one newspaper, hotels, stores, and dwellings. Other towns are Monitor and Silver Mountain.

Topography.—It is a mountain county, cut by a succession of ranges with high and precipitous peaks, interspersed with numerous lakes, rivers, creeks, and small valleys. Silver Mountain, the highest, has an altitude of 10,000 feet. Its principal lakes and small bodies of water are Blue Lakes and Caples Lakes, in the eastern part of the county. There are numerous other smaller lakes throughout the county, which is also well supplied with numerous brooks, creeks, rivulets, and rivers heading up in the mountains, and fed by the lakes and the melting snows. The Carson River, with its east and west forks, heading in the southern part, flows through the county from south to north, with many other tributary creeks and streams. The principal mountain valleys are Diamond, Hermit, Pleasant, Hope, Faith, and Charity. Diamond Valley, in the northeast, con-

tains some very rich and productive ranches, raising wheat, barley, oats, hay, and potatoes. The three sister valleys, Faith, Hope, and Charity, in the northwestern part of the county, are 7,500 feet above sea-level, inhabited only by stockmen and dairymen, and only during the brief summer season. The entire western portion of the county is a wild, mountainous region, with grand alpine-like scenery, wrapped in snow from November till June, pasturable for a brief summer season, and covered with forests of heavy and valuable timber.

Soils.—The valley soils are heavy alluvium, very rich and fertile.

Climate.—The average summer temperature is 75°. The winters are extremely cold.

Irrigation.—Little irrigation is practiced, the 16 miles of ditch in the county being originally constructed for mining purposes.

Agriculture.—This industry is confined principally to grain, hay, and potatoes, altogether for home use. The dairy interest possesses considerable importance, about 30,000 pounds of excellent butter being produced annually.

Horticulture.—No interest is taken in horticulture, apart from the needs of home consumption—the total bearing fruit acreage being 16, and non-bearing 12½, principally apples.

Stock.—Its stock production is chiefly cattle, mostly for dairy use, and some sheep are herded there during the summer months.

Timber.—The timber is almost entirely undeveloped, very little being cut since the cessation of work on the Comstock mines, and is awaiting transportation facilities for its development.

Mining.—In the early days of silver mining, this county was the scene of considerable activity and enterprise, but during the long interval from then till now, these interests have remained dormant, though they are looking more promising at this time.

Health and Pleasure Resorts.—Though this county is isolated and somewhat difficult of access, it is not a little resorted to in the summer by pleasure seekers, on account of its beautiful mountains, lakes, and scenery and its mineral springs, of only local fame.

AMADOR.

Amador County is bounded north by El Dorado, east by Alpine, south by Calaveras, and west by Sacramento County.

Statistics.—Area, 650 square miles, or 416,000 acres. Unentered Government land, 100,000 acres. Lands assessed, 252,717 acres. Total assessed valuation of all property, \$4,143,312. Rate of taxation, State and county, 2.00. County property, \$80,000. County debt, none. Number of miles of railroad, 9; assessed at \$64,037. Number of schools, 61. School children between 5 and 17 years, 2,831. School money, \$43,981 35. Population, census of 1890, 10,315.

County Seat and Principal Towns.—The county seat is Jackson; population, 1,200. The principal towns are Ione, population 1,000, the terminus of railroad from Galt, on Western Division of the Southern Pacific; Sutter Creek, Plymouth, Volcano, Drytown, Amador, Oleta, Forest Home, and Pine Grove.

Topography.—The county extends from the summit of the Sierra Nevada range to the Sacramento Valley. The eastern portion is narrow, and for a distance of about 30 miles is included in the foothill region, ranging in elevation from 2,000 to 4,000 feet above sea-level. The surface is somewhat rugged and broken, and cut by streams running through deep cañons. The remainder of the county belongs to the lower foothills, with gradually diminishing elevation as it approaches the valley. This section contains numerous fertile valleys, varying from 3 to 6 miles in length and from 2 to 3 miles in width. Ione and Jackson Valleys are each from 12 to 15 miles long and from 2 to 5 miles wide. The lowest altitude of the county, near Ione City, is 335 feet above sea-level.

Soils.—Near Ione and in the lower portion of the county the soil is an alluvial deposit, deep and fertile, sometimes mixed with adobe. Toward the foothills this changes to the red adobe so characteristic of the foothill regions, impregnated with iron, and forming the best of fruit land. In the higher foothills this changes to a gravelly character, terminating in rocks in the mountain regions.

Climate.—The climate varies with the topography, in the lower portions similar to the Sacramento Valley—summer days usually warm, sometimes hot, tempered down by

afternoon breezes, and cool at night. The winters are pleasant, with frosty mornings, similar to Sacramento, though with more bracing and clearer air, owing to greater altitude. The highest altitudes are cool and spring-like in summer, and decidedly cold in winter, with biting frosts and heavy snowfalls. Average annual rainfall at Jackson for ten years, 31.81 inches; average annual rainfall at Ione for ten years, 19.63 inches. The difference is due to difference in elevation and topography.

Irrigation.—There are 108 miles of water ditch and flume in the county, assessed at \$180,000. These were primarily constructed for mining, but are used for irrigation, though very little, if any, is necessary. The water charges are reasonable.

Agriculture.—The production of hay, grain, alfalfa, and vegetables is naturally limited to the demands of home consumption. Where suitable soils are selected, however, the yield is large.

Horticulture.—Amador is making considerable progress in fruit raising. The principal fruit sections are Ione and Jackson Valleys. The grape is the favorite fruit for the most part, and thrives on the foothill soil, growing without irrigation. Peaches, apples, prunes, plums, apricots, pears, and other deciduous fruits are grown in minor quantities. The olive and fig, wherever grown, do well. English walnuts, almonds, and other nuts also thrive in these sections. The apples in the higher foothills possess the finest flavor and keeping qualities. The same warm belt as found in Butte, Placer, and El Dorado traverses this county also, and in properly selected spots oranges and lemons of remarkable size and quality are produced. Acres in fruit trees, 1,073—bearing, 445; not bearing, 628. Fruit is shipped either to Stockton, San Francisco, or Sacramento, where considerable finds its way to the canneries. Much fruit is dried in the county. The district needs a cannery.

Foothill Experiment Station.—The Foothill Experiment Station of the State University is located in this county, 5 miles from Jackson, on the Amador Ditch. It contains 36 acres, and is devoted to the purposes of testing the adaptation of soils and location to the various fruits, trees, and vines, deciduous and citrus.

Timber.—There are large amounts of sugar and yellow pine, fir, spruce, and cedar timber in the mountains, though vast quantities have been used in the mines.

Mining.—The quartz mining industry is very extensive; the annual gold bullion product is about \$2,000,000. There are 25 quartz mills in operation, working on the product of the various mines, chiefly located on the great Mother Lode, which traverses this county. In the revival of gold mining in California, which now seems imminent, Amador County is destined to be among the first. Much foreign capital has recently come in and many properties are changing hands. The county is rich, also, in marble, freestone, limestone, and copper, and near Ione, at Carbondale, and other localities, coal of the lignite character is found, and mines are being worked. Large deposits of aluminium clay are found here.

BUTTE.

Butte County is bounded on the north by Tehama and Plumas, on the east by Plumas and Yuba, on the south by Yuba and Sutter, and on the west by Colusa, Glenn, and Tehama Counties. The Sacramento River runs along its extreme western boundary. It is about 60 miles wide east and west, and 80 miles from north to south.

Statistics.—Area, 1,765 square miles, or 1,200,000 acres. Unentered Government land, 100,000 acres. Lands assessed, 790,414 acres. Total assessed valuation of all property, \$18,104,974. Rate of taxation, State and county, 1.40. Number of miles of railroad, 59.90; assessed at \$856,198. County property, \$50,000. County debt, \$52,250 33. Number of schools, 74. Number of school children between 5 and 17 years, 4,187. Public school money, \$92,968 92. Population, census of 1890, 17,904.

County Seat and Principal Towns.—Oroville, the county seat, has a population of 2,000. The other principal towns are Chico, population 2,892; Biggs, population 1,000; Gridley, Nord, Nelson, Durham, and Palermo, population 600. There are also many other smaller towns. Oroville, the county seat, is located on the Feather River, about 30 miles from Marysville, with which place it is connected by railroad. This is the distributing point of supplies for the mining and milling districts in a growing area of 100 miles square, north and east. It possesses banks, hotels, two newspapers, fine churches, flour mills, foundries, and schools, and large and substantial brick business buildings. Average

annual temperature, 64.9°; average winter temperature, 52°; average coldest month, 49.4°; lowest, 20.1°—higher than Jacksonville, Florida; same as Mediterranean coast of France.

Chico, with a population of 2,892, the largest town in the county, and the center of fruit shipments, is situated about 5 miles from the Sacramento River, on the Oregon Division of the Southern Pacific Railroad. It has two daily newspapers, two banks, large hotels, gas and waterworks, roller flour mills, and numerous other manufactories. The Branch State Normal School for the northern part of the State is located here.

Gridley has a weekly newspaper, lumber yard, flour mills, and over forty brick business houses.

Biggs is an important shipping point for grain. It has two newspapers, hotels, and many business buildings.

Moore's Station is a thriving town, and the terminus of a large flume, by which an immense amount of sugar pine and other lumber is floated from the mountains. Large quantities are stored and shipped here.

Topography.—The area of Butte County comprises 595 square miles of valley land, 965 square miles of foothill land, and 160 square miles of mountain land. Of the valley land, 70 square miles is treeless, adobe soil. The Sierra Nevada Mountains, on the east, are not so lofty and precipitous as in many other sections of the State, and no snow remains on them during the summer. The mountains are heavily timbered and abound with grassy meadows. The Sacramento River skirts the western boundary, and the county is traversed in a direction from north to south by the Feather River, a tributary of the Sacramento, and having three branches from the mountains, uniting about 3 miles above Oroville. Butte and Chico Creeks are quite large streams, and run into the Sacramento north of and parallel with the Feather River. These, with a number of minor streams, all fed by the mountains, and flowing southwesterly through the plains, render this county one of the best watered in the State.

Soils.—The soil may be divided into four classes: Black adobe around Biggs; Nelson and Durham are better adapted to cereals. Mixed clay and adobe at Dayton, Chico, and Nord—good grain, hay, and fruit lands. Red soil of the foothills—excellent for fruit, and by many experts regarded as the very best for horticultural pursuits. River bottom, alluvial, of a sandy loam, very rich, and easily worked; equally good for all vegetable growths.

Climate.—The climate is as varied as the topography; mild and equable in the valleys and lower foothills, with occasional hot days in summer, and in winter the cold is never severe, the thermometer for sixteen years showing no record below 22° above zero. The higher foothills give less heat in summer, and about the same winter cold as in the valleys. The high mountains are balmy and spring-like in summer, while in winter a severe Eastern temperature prevails. Chico, highest summer temperature, 111°; lowest winter, 28°; mean annual rainfall at Chico, 21.78 inches.

Irrigation.—Butte County possesses abundant irrigation facilities. Two large canals terminate at Oroville, constructed originally for mining, and now used for irrigation. An immense scheme is under way for diverting water from Feather River, where it leaves Big Bend Tunnel, to the east and west, into two large canals, which will afford sufficient water for all the arable land of the county. A canal is being extended from Oroville to Biggs, and farther west, which will supply water from the Feather River to a large fruit district. While most of the lands adjoining the streams are alluvial in character, and do not require much irrigation, especially in view of the abundant annual rainfall, still the discrete use of water in irrigation will give the best results in many of the districts devoted to fruit culture, and is indispensable in the raising of nursery stock. This is especially true in districts like the prosperous colonies of Thermalito and Palermo, where orange culture is so extensive an industry. The county has 331 miles of canals, assessed at \$316,160.

Agriculture.—In the production of grain, Butte is one of the best sections. Large acreages are annually in wheat, and the yield is large. The different towns along the railroad are well supplied with large storage warehouses to handle the immense product. We have no statistics at hand to give the exact output. Alfalfa fields in the bottom lands, without irrigation, yield immensely, giving four crops in the year.

Horticulture.—Since 1886 the horticultural industries of Butte County have made wonderful strides, bringing into prosperous bearing such colonies as Rio Bonito, Ther-

malito, Palermo, and others, until the county now stands up in the first rank. The Assessor's report for 1892 shows 770,000 fruit trees already planted in this county, which places it seventh among the counties of the State, being exceeded only in number by Los Angeles, San Bernardino, San Diego, Santa Clara, Solano, and Sonoma. There are 2,264 acres in orange trees, which brings it to the fourth in rank among the citrus counties of the State. There are about 800 acres in grapes; only seven other counties show greater acreage. Citrus fruits do well over a large area, and Butte is the leader in quantity in the Northern Citrus Belt. She has taken many premiums for citrus fruits and shipped largely to Eastern markets. The first carload of oranges from this State to the East during the season of 1891-2, was shipped from Butte County, December 12, 1891. Her orchards embrace some very large ones—one of 1,750 acres, one of 500 acres, one of 300 acres, one of 200 acres, and many of 100 acres and over. In deciduous fruits, almonds, and figs, she stands in the front rank. Peaches find a natural home here, doing well and making phenomenal growth throughout the entire fruit district. Cherries are a favorite and large crop. Apricots nearly rank with them. Large quantities of the soft or paper-shell almonds were marketed in the East last fall at 20 cents a pound. Her raisin product is also extensive. Prunes and plums are an excellent crop, also apples in the higher altitudes. Samples of the White Adriatic fig, dried, show up almost equal to the imported Smyrna. She has a large acreage in olives. In a word, there is scarcely a fruit or nut of the temperate and semi-tropic zones which cannot be profitably raised in Butte County. Butte markets her fruit, both dried and green, by shipments to the East, and at her local and the Marysville canneries. The estimated output for 1892 is 8,595,000 pounds. The famous Bidwell orchard of Chico is the oldest and largest orchard in the county, which furnished 5,348,679 pounds of fruit in 1891. The State Board of Horticulture reports in the county: acres in fruit, bearing, 4,315; not bearing, 8,370; total, 12,685. Of course the estimates of the Assessor err on the side of conservatism.

Stock and Dairying.—Large bands of cattle and sheep are herded during the summer in the mountains and in the rich mountain meadows, which are well watered and are clothed with rich natural grasses. A large amount of timothy hay is raised in the mountain meadows of Butte, and the dairy interest is very extensive and profitable, the best of products being turned out under these favorable conditions. Assessor's report for 1892 shows: Horses, 9,251; mules, 2,240; cattle, 12,495; sheep, 46,134; hogs, 8,501; goats, 660. Much butter is made, especially in the mountains, where timothy hay and natural grasses are abundant.

Timber.—The timber is extensive and valuable, sugar pine leading in value, followed by fir, spruce, and cedar, and an immense amount has been put into market during the past thirty years, averaging over 25,000,000 feet a year. There are a large number of mills at work in the mountains, and their product is shipped by extensive V flumes and by teams to the railroad. A large number of men find employment as loggers, millmen, and teamsters. There are eleven lumber mills in the county.

Mining.—The Big Bend Tunnel diverts from its channel for 13 miles the waters of the North Fork of Feather River. Over \$1,000,000 capital is invested in this enterprise, and immense yields of gold are looked for from the dry bed of the river.

It is difficult to give accurate figures of the output of gold since the inception of mining, but it has certainly reached hundreds of millions; single mines have yielded \$5,000,000 each, and the annual yield for many years was over \$20,000,000. Many large quartz and drift enterprises are now being worked, and the new law of Congress, relative to hydraulic mining, must greatly stimulate these industries and increase the annual yield. Six or seven new quartz mills, and many new ledges, were opened during the past year.

Manufactures.—Aside from the saw mills, which do the most manufacturing, the flour mills of Butte are numerous, located at Oroville, Chico, Durham, Gridley, and other towns, and turn out a large annual product. All the leading towns have their fair proportion of manufacturing industries. There are also several fruit and vegetable canneries.

Prices of Land.—Prices range from \$10, in the more remote and virgin districts, to \$100 per acre for the best alluvial lands, not including improvements. Liberal inducements, on easy terms of payment, are offered to the settlers by various companies.

CALAVERAS.

Calaveras County is bounded north by Amador, east by Alpine and Tuolumne, south by Tuolumne and Stanislaus, and west by Stanislaus and San Joaquin Counties.

Statistics.—Area, 971 square miles, or 668,000 acres. Unentered Government land, 175,000 acres. Lands assessed, 405,933 acres. Total assessed valuation of all property, \$4,256,898. Rate of taxation, State and county, 1.75. County property, \$26,000. County debt, \$28,054. Number of miles of railroad, 10.46; assessed at \$84,618. Number of schools, 59. School children between 5 and 17 years, 2,361. School money, \$39,618 58. Population, census of 1890, 8,970.

County Seat and Principal Towns.—Its county seat and principal town is San Andreas, population 600; altitude, 1,600 feet above the level of the sea. Other towns are Milton, Valley Springs, Mokelumne Hill, Sheep Ranch, Murphys, Altaville, Angel's Camp, Vallecito, and Copperopolis.

Topography.—Beginning near the plains in the western part it is first a succession of rolling hills interspersed with small valleys, up to loftier hills until it terminates in mountains in the eastern part, the whole varying in elevation from less than 100 feet above sea-level to over 5,000 feet in the eastern extremity. The altitude of Milton and Valley Springs is about 1,000 feet; San Andreas, 1,600 feet; Murphys, 2,300 feet; Big Trees, 4,700 feet. On its northern boundary runs the Mokelumne River, on the south the Stanislaus, and through it midway between, the Calaveras, all possessing numerous tributary streams. The lower portions show oak and pine sparsely scattered; the higher altitudes are most densely timbered with gigantic trees. The Mother Lode of Amador County also extends through this county. There are about 790 square miles in the foothill region, and 180 in the mountainous region.

Soils.—The soil is very variable, each desirable for its special adaptations. The higher mountains are mostly gigantic boulders and ledges of granite. We have first, the black, sandy loam of the bottom lands, then the alluvial soils bordering on the plains, then the red loam of the foothills, then the upper, purely granitic soils. The red soils of the foothills are well adapted for fruit and grain and stand judicious irrigation with best results.

Climate.—The climate is very similar to that of Amador County. The average annual rainfall at Valley Springs is about 20 inches, increasing as the altitude increases up to the snow line—the average for the county being about 25 inches. The snowfall in the mountains is always heavy enough to insure abundance of water for the streams and irrigating and mining ditches. The western part, for 32 miles, has an average annual temperature of 60° to 68°; the upper foothills, up to the snow line, from 44° to 52°. In summer a midday temperature of 100° may occasionally be reached, but the nights are invariably cool and refreshing.

Irrigation.—The canal and irrigation system in this county is very extensive, owing to the large number of mines in operation, and water can be taken from them in most any of the lower parts of the county. There are eleven systems, or over 600 miles, of canal, and many storage reservoirs, assessed at \$145,750. Water is supplied at about 12½ cents per miner's inch a day.

Agriculture.—The western and northwestern portions of the county are mainly devoted to raising wheat and barley, both for grain and hay, much of which is shipped out of the county, but the largest quantity is marketed at home among the mines and in stock sections. Calaveras does not pretend to much rank as a grain-shipping county. Of course alfalfa and vegetables are raised abundantly for stock or home consumption. The dairying interest derives its profit from local consumption.

Horticulture.—The county produces a long line of fruits, both deciduous and citrus, although its record is not great in this line of production, owing to the lack of railroad transportation. Wherever attention has been given to fruit raising the most excellent results have been obtained. The entire range of peaches, plums, prunes, apples, grapes, figs, olives, almonds and other nuts, apricots, and small fruits, and most excellent oranges are raised in a number of places. The fruit industry only needs transportation to develop into large proportions. At Campo Seco there are orange trees thirty years old bearing paying crops yearly. Oranges are also successfully raised at Jenny Lind, Poverty Bar, Robinson's Ferry, San Andreas, and Mokelumne Hill, even at an altitude

of 1,300 feet. Olives do equally well and large numbers have been planted. Many Stockton business men are interested in Calaveras fruit growing. There is a buhac (or insect powder) farm near Comanche. Nearly 200 tons of green and dried fruits were shipped from the county in 1892. The wine industry is also extensive in Calaveras, the vineyards doing splendidly. There are fruit trees in the county, bearing, 791 acres; not bearing, 552 acres. The principal fruit sections are Valley Springs, Burson, Wallace, Campo Seco, and Jenny Lind.

Stock.—Large numbers of cattle and sheep are raised in this county, and the mountains are extensively used during the summer months for herding numerous bands from the lower country and from the plains of the San Joaquin. Assessor's report for 1892 shows 4,360 horses, 14,127 cattle, 150 mules, 26,070 sheep, and 3,100 goats.

Timber.—The timber resources are enormous. Large amounts have been used in the mines and locally, yet the vastly greater portion in the mountains has been untouched. Sugar pine, yellow pine, fir, spruce, and cedar abound. About 4,000,000 feet of lumber and 2,000,000 shingles are manufactured annually, in which industry six or seven mills are actively engaged. Railroad facilities, an extension of which is now being urged in the immediate future from Milton and Valley Springs to the Big Trees and vicinity, will vastly increase this output and add immensely to the resources of the county.

Mining.—There are over one hundred quartz and gravel mines in Calaveras, distributed throughout the upper foothills and mountains, at San Andreas, Mokelumne Hill, Sheep Ranch, Murphys, Angel's Camp, Carson Hill, Altaville, Vallecito, Robinson's Ferry, Albany Flat, Railroad Flat, West Point, and other places, whose output of gold almost equals, if it does not surpass, that of Amador. There are several chlorination and reduction works in the mining regions, of large capacity, for handling sulphurets and rebellious ores. There are several copper mines, also, at Copperopolis and Campo Seco. Valley Springs ships 20 tons daily, and Copperopolis 15 tons. The United States cruisers, "Charleston" and "San Francisco," were sheathed with copper from these mines. Iron, limestone, marble, and granite of finest quality, and lignite coal also abound, only awaiting development. Over \$500,000 of English and San Francisco capital has been expended on mine and mill developments and constructions during the past year.

Pleasure Resorts.—The Calaveras Big Trees, altitude 4,700 feet, are well worthy the tourist's attention.

COLUSA.

Colusa County is bounded north by Glenn, east by Sutter, south by Yolo, and west by Lake County.

Statistics.—Area, about 1,200 square miles, or about 768,000 acres. Lands assessed, 572,483 acres. Total assessed valuation of all property, \$13,390,320. Rate of taxation, 1.20. Number of miles of railroad, 33.91; assessed at \$271,438. County property, \$100,000. County debt, none. Number of schools, 37. School children between 5 and 17 years, 2,098. School money, \$45,593 38. Population, estimated after division and formation of Glenn County, census of 1890, 8,352.

County Seat and Principal Towns.—Colusa, the county seat, has a population of 1,336, by census of 1890. Other towns are: Maxwell, population 500; Williams, population 1,000; Arbuckle; College City, population 600, etc.

Colusa, the county seat, is a flourishing and pleasant town, with a bank, hotels, several fine public buildings and churches, first-class schools, two newspapers, and many handsome residences.

College City is the seat of Pierce College. It is a strictly prohibition town.

Williams has a newspaper, large grain warehouses, fine business buildings and residences.

From Sites, the terminus of the railroad from Colusa, stages take tourists to the famous Bartlett Springs of Lake County, near the western boundary of Colusa County.

Topography.—Of the entire area of the county, approximately, one half is the Sacramento Valley, one third arable hills, and one tenth interior valleys, the balance being mountainous. A range of hills runs north and south through the county, parallel with the Coast Range, which forms the western boundary of the county. Between these is a series of smaller valleys. Stony Creek heads within 20 miles of the south boundary of the county, separated by a small divide from the waters of Cache Creek. It thence

runs northerly, skirting the base of the mountains, to the northern boundary of Glenn County; then breaks through the range of low hills and flows southeasterly across the valley to the Sacramento River. Several other streams, nearly as important, heading in the Coast Range, flow through Yolo and Solano Counties into the tule basin. The Sacramento River, which skirts the eastern boundary of Colusa County, runs on a slight ridge which is higher than the lands lying west of it, and the smaller streams, which only run in wet winters from the hills below, empty into the trough thus formed. This trough begins 6 or 7 miles south of the mouth of Stony Creek, and, gradually widening, becomes a tule basin near the lower end of the county.

Soils.—Along the river, bordering the hills, and in many of the smaller valleys, the soil is a loose, rich, sandy loam, easily worked, retaining moisture and very fertile. In some places it is adobe, a light or heavy clayey soil, producing excellent crops, but must be properly cultivated and at the right time. The foothill soil is rich, mellow, easily worked, and possesses every element of adaptation to the production, in perfection, of all fruits known to temperate or semi-tropic countries. The main valley is all alluvial, and has given Colusa County the distinction of being for years the banner wheat county of the United States.

Climate.—The climate does not vary much from a great portion of the Sacramento Valley, except that the summer temperature is lower along the river bordered by timber growth than on the plains and among the foothills devoid of timber. In lower elevations the days are warm from the middle of June to the middle of September, but delightful through the remaining nine months. The dryness of the air in summer makes the nights refreshing. In winter some frosts occur. The rains in the valleys and on the foothills begin in October and continue at intervals till May. The climate of the Coast Range on the western boundary is one of the finest and most healthful in the world. The average summer temperature is 79.6°. The average winter temperature is 48.5°. The highest occasional extreme is 113° and the lowest 20° for the Sacramento Valley, taken from observations at Colusa, Princeton, Williams, Willows, Orland, and College City. The average annual rainfall for the same localities is 14.42 inches.

Irrigation.—Although in many places in the county irrigation is not required for any form of vegetation, yet over the greater portion it is essential for the best results, for all growths except cereals. An extensive scheme of irrigation has been inaugurated by the Central Irrigation District, organized December, 1887. The district extends from 10 miles north of Willows, in Glenn County, southward for nearly 40 miles, and has an average width of 6 or 7 miles. It will draw its water from the Sacramento River by a canal, which, at its beginning, will have a width on the bottom of 60 feet and on top of 96 feet, with a depth of 6 feet; 20 miles south this is reduced to 79 feet in width. At its terminus it will show 25 feet bottom and 49 feet surface width. Thirty miles of this work has been satisfactorily completed. The cost of preparing lands for irrigation in this district will be comparatively small, because they are of so uniform a grade. The lands slope to the east about 10 feet to the mile at first, decreasing to 5 feet and less near the eastern boundary.

Agriculture.—The main part of the valley is devoted to wheat production. Before the segregation of Glenn County on the north, Colusa in one year produced 7,250,000 bushels of wheat for export. Grain farming is conducted on a colossal scale. Combined harvesters, drawn by traction engines, cut a swath of 40 feet; the grain in sacks being thrown off at the rear. The same engines, in plowing season, drag twenty-four ten-inch plows, doing in twelve hours the work of one hundred mules for the same time. The grain ranches are mostly owned in very large acreage.

Horticulture.—Although not much attention was paid to fruit culture prior to 1884-5, since that period the industry has made rapid strides. All the temperate and semi-tropic fruits grow successfully side by side in this county. There is a wide range of adaptability in the soil and climate. Prunes are a favorite crop, next peaches, pears, and apricots; also cherries, plums, nectarines, almonds, walnuts, and other nuts, olives, grapes for raisins, for table use, and for wine, and apples in the higher altitudes. Citrus fruits are also successfully grown, and although not much extensive planting has been done, they can be grown as successfully as in other sections for the purpose of profit and foreign shipment. The raisin grape thrives abundantly near College City, Colusa, and other points, and over 80 tons of raisins were shipped in one season

from this section. The fruits of Colusa are marketed by green shipment to Sacramento and the East, by drying, and at the local canneries. Colusa supports a drying and packing establishment which put up over 4,300 cases in 1891, and last season this output was largely exceeded. The dried fruit shipments for the same period consisted of apricots, peaches, prunes, pears, nectarines, and almonds, and amounted to 168 tons. The prices for green fruit were about 1 cent a pound on the trees. In the season of 1892 deciduous fruits brought from $1\frac{1}{2}$ to 2 cents a pound on the trees. The acreage in fruit trees is, bearing, 930; not bearing, 1,218.

Stock.—The cattle, horses, and sheep raised in Colusa County are very numerous and of fine grades, though the stock business is subordinate to and dependent on the agricultural and fruit interests. The hog product is quite large. Assessor's report for 1892 shows: Horses, 6,293; mules, 3,264; cattle, 7,965; hogs, 10,874; sheep, 25,788; goats, 3,563; poultry, 1,550 dozen.

Timber.—The scattering oak in the county along the streams and in the foothills is used for fuel. The pine, spruce, and cedar in the mountains are not so readily accessible as in other districts, nor so valuable, and have not, therefore, been much encroached upon.

Mining.—This is not in general a mining county, though in the Coast Range there are deposits of gold, cinnabar, copper, and chromic iron, lying ready for future development. A good quality of limestone is also found, and a fine cement in unlimited quantities. In the southwestern part of the county there are surface indications of oil and natural gas, and near Sites salt springs are found.

Prices of Land.—The prices of unimproved land in Colusa County range from \$10 to \$50 an acre, according to the location and fertility, and nearness to rail and river transportation.

CONTRA COSTA.

Contra Costa County is bounded on the north by the San Joaquin River, which separates it from Sacramento County, and by San Pablo Bay, Suisun Bay, and Straits of Carquinez, on the east by Old River, separating it from San Joaquin County, on the south by Alameda County, on the west by Alameda County and San Francisco Bay.

Statistics.—Area, 734 square miles, or 489,760 acres. Lands assessed, 462,271 acres. Total assessed valuation of all property, \$15,686,308. Rate of taxation, State and county, 1.20. Number of miles of railroad, 72.35; assessed at \$773,625. County property, \$46,000. County debt, \$8,000. Number of schools, 75. Number of school children between 5 and 17 years, 3,441. Public school money, \$88,486 50. Population, census of 1890, 13,503.

County Seat and Principal Towns.—Martinez, population about 2,000, is the county seat. The principal towns are Antioch, Brentwood, Byron, Concord, Clayton, and Port Costa.

Martinez is connected by rail with San Francisco and Oakland, and with the San Joaquin Valley. It also is the terminus of a branch of the San Ramon Railroad, running through the Pacheco, Ignacio, and San Ramon Valleys. It has banks, two newspapers, good hotels, public buildings, and large warehouses, fruit cannery, flour mills, and fine residences with grounds lined with shrubbery, vines, and fruit trees. It also has a daily steamer connection with San Francisco and Stockton.

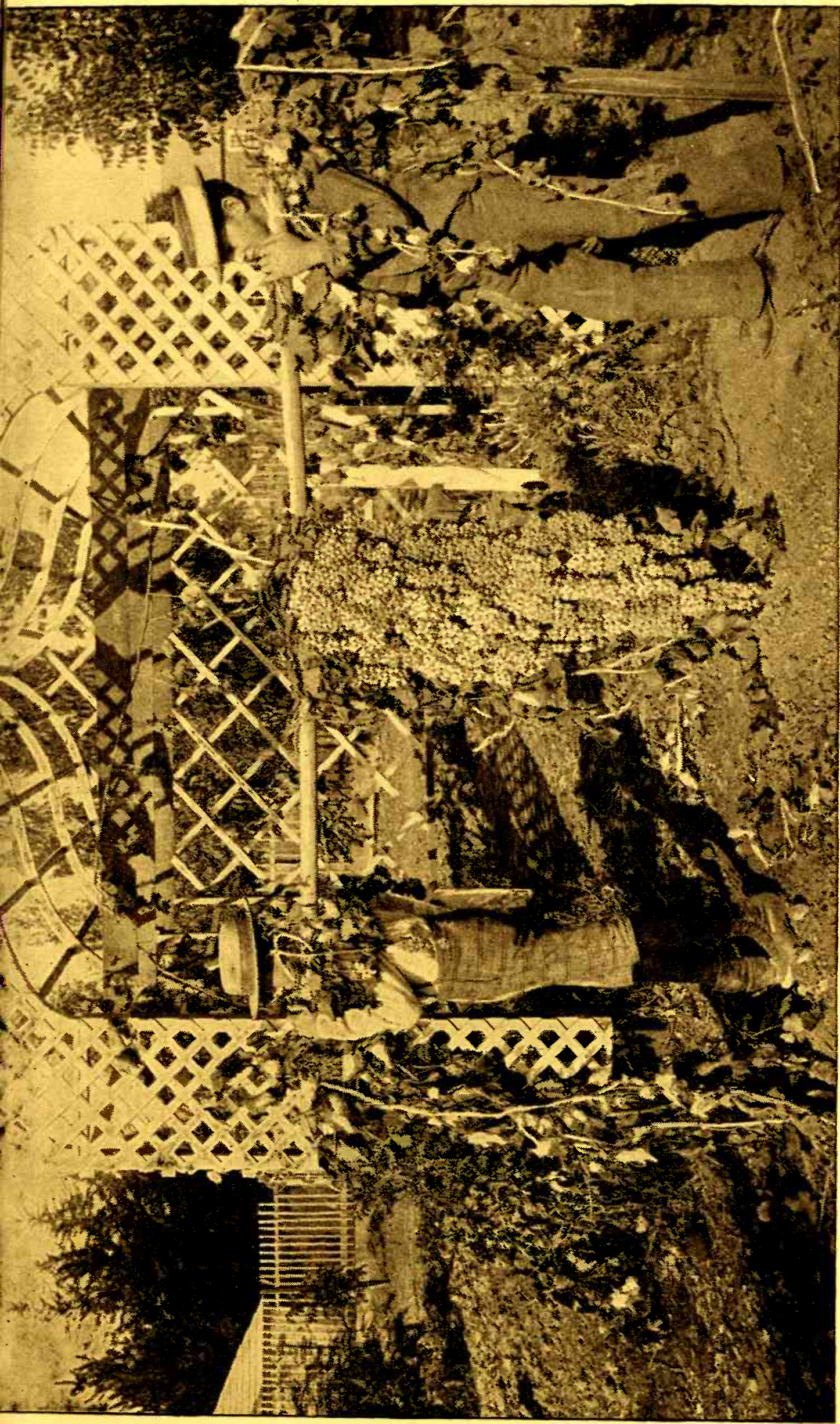
Antioch is on the bank of the San Joaquin, where the largest ocean vessels can load. It is the shipping point for the Mount Diablo coal mines; is provided with large warehouses, and has paper mills and the largest distillery in the State.

Brentwood and Byron are the shipping centers of 60,000 acres of choice wheat-producing land, on the Southern Pacific Railroad.

Port Costa is the shipping point for the bulk of the grain raised in California; has warehouses for storing over 135,000 tons of grain, with a dock frontage of 2,300 feet, affording facilities for loading from eight to ten large ocean ships at the same time.

At Pinole are located large stockyards; near Vallejo Junction, the largest smelting works in the State; at Vallona are extensive lumber yards, where ships from Oregon and Puget Sound discharge cargo. At Crockett are flour mills of the capacity of 9,000 barrels a day; also agricultural works.

Topography.—Southeasterly across the county, and parallel with the coast, the second great and distinct range of mountains forms a natural division between the east-



THOMPSON'S SEEDLESS GRAPES, product of one vine, 100 pounds.

ern and western sections. The chief feature of this range is Mount Diablo, 3,896 feet above sea-level, nearly in the center of the county. The central valley is the Ignacio, 10 to 12 miles long, and about 6 miles wide. From Suisun Bay southward to Livermore are the valleys of Alhambra, Pacheco, Diablo, San Ramon, Moraga, Tice, Green, Sycamore, and Tassajaro. All of these valleys more or less closely environ Mount Diablo. The western portion of the county is highly broken up, and is more elevated, except where to the northward is rolling mesa or level bottom land on the bay. Eastern Contra Costa contains about 60,000 acres of rich, alluvial lands, and to the northward and eastward about 50,000 acres of tule land.

Soils.—The soil in the western part is stony, but produces large crops of succulent grasses, which constitute it a good stock country, especially kept green by the moisture of the fogs. The central valley portion consists mainly of chocolate loam of great depth, with sandstone underlying and limestone outcropping in higher altitudes. Good water is obtained from 10 to 40 feet depth. The eastern portion ranges from sandy loam and alluvial to adobe, the bedrock being sandstone.

Climate.—The climate of the western part is cool and bracing, influenced by the ocean breezes and fogs. The central valleys possess a delightful average between the warm San Joaquin and the bracing atmosphere of the coast. The average annual rainfall is about 18 inches. Its mean annual temperature is from 52° to 60° from the western to the central part, and from 60° to 68° in the eastern portion. The summer temperature around Byron and Brentwood, in the eastern part, is much higher than that at Martinez and the valley adjacent.

Irrigation.—No irrigation is required in this county, unless it should be in the extreme eastern portion.

Agriculture.—Notwithstanding the growth of the fruit industry, grain raising still leads in this county. Many farmers have grown rich from wheat production. The chief product of the eastern section is wheat, although much barley, hay, alfalfa, and fruits and vines are grown. Alfalfa around Byron yields 7 to 10 tons per annum, without irrigation, and is worth from \$9 to \$12 per ton in San Francisco, according to the season. All vegetables grow enormously, especially in the central portion.

Horticulture.—The main fruit product comes from the central portion, in the valleys above described. The wild-oat hill lands with southern exposure are nowhere equaled in the State for olive culture. Among the numerous fruits produced are the pear, plum, prune, apricot, cherry, peach, quince, fig, nectarine, pomegranate, olive; of small fruits, strawberry, raspberry, blackberry, gooseberry, and currant; of nuts, almond, walnut, pecan, filbert, and chestnut. Over 6,000 acres are devoted to these fruits, and fruit raising has proved both successful and remunerative. Oranges are grown successfully in sheltered localities. Fruit trees in bearing, 2,347; not bearing, 1,575. There are also 3,845 acres in wine grapes. Prunes and pears are the leading fruits, and next to them, almonds. The greater part of the fruit product is shipped green to San Francisco.

Stock Raising.—Stock raising is a most profitable industry, especially fine stock, and considering its size, no county in the State can show better grades of blooded stock. There is one stock farm of 6,000 acres, which has a large number of draft horses, 300 trotters, 100 Aberdeen-Angus cattle, 100 Devons, and 60 short horns—all of the finest grades. Many business men of San Francisco own ranches in this county, and take great pride in their development. Western Contra Costa is especially well adapted to stock raising and dairying, owing to the fogs and moisture, and the resultant luxuriant growth of natural grasses and their long endurance, early to spring up and late to disappear. Assessor's report for 1892 shows: Horses, 8,787; cattle, 14,973; hogs, 3,262; mules, 182; sheep, graded, 20,047; poultry, 3,197 dozen.

Mining.—The only important mining industry is the coal mines of Mount Diablo, although some little mining for precious metals has been done.

Manufacturing.—The principal industries in this line have been referred to above in the account of the principal towns—the smelting works on the bay, the large flour mills, agricultural works, paper mills, powder mills, fruit and vegetable canneries, distilleries, wine and brandy manufactories, slaughter and packing houses, planing mills, etc.

Pleasure and Health Resorts.—Byron Hot Springs, near Byron, three hours from San Francisco by rail, furnishes hot and cold, salt and sulphur, and mineral and mud baths, from its natural mineral springs. They are much resorted to by sufferers from

liver and kidney disorders, rheumatism, and chronic dyspepsia. The hotel and bathing accommodations are first class.

A trip to Mount Diablo will amply repay the tourist. From its summit can be enjoyed a view of unsurpassed beauty, including a panorama of plains and hills, land and ocean, of an area scarcely less than the State of New York.

DEL NORTE.

Del Norte County is bounded on the north by the State of Oregon, east by Siskiyou County, south by Humboldt County, and west by the Pacific Ocean, lying in the north-western corner of the State, and having a sea coast of 35 miles.

Statistics.—Area, 1,546 square miles, or 989,000 acres. Unentered Government land, 700,000 acres. Lands assessed, 126,539 acres. Total assessed valuation of all property, \$2,218,327. Rate of taxation, State and county, 1.50. Miles of railroad, none. Value of county property, \$19,000. Total county debt, \$9,517 67. Number of schools, 13. School children between 5 and 17 years, 517. School money, \$12,202 17. Population, census of 1890, 2,570. The present population as claimed is about 4,000.

County Seat and Principal Towns.—Crescent City, the county seat, has a population of about 1,500. It is located on the coast about 15 miles north of the mouth of Klamath River, and possesses a fair harbor. It is commercially a dairy and lumber center, having a saw mill employing 100 men, and a shingle mill employing 50 men. Here are located the county buildings, two newspapers, school buildings, stores, etc. It has water communication by steam and freight vessels with San Francisco, distant 280 miles, and by a stage line 90 miles to Grant's Pass, Oregon, connecting with the Oregon Division of the Southern Pacific Railroad. The other towns are Smith River, population 300, in the center of the dairy and farming districts; Altaville, and Gasquet.

Topography.—This county presents a succession of mountain ranges, broken by narrow valleys. The mountains of the eastern portion are from 5,000 to 6,000 feet high. Snow remains on their summits until late in the summer. The Klamath River, a large stream heading at Lake Klamath in southern Oregon, 140 miles from the ocean, flows through Del Norte County on the east, dips down into Humboldt County, and returning into Del Norte enters the ocean about 12 miles north of its southern boundary. Smith River, with its numerous branches, is a considerable stream traversing the northern part of the county. The redwood timber belt extends through the western part of the county from north to south, and is from 4 to 10 miles in width. The area suitable for cultivation is confined to Smith River Valley and a small belt on the ocean near Crescent City.

Soils.—The soil in these narrow valleys is extremely fertile, and is suited to all varieties of vegetables and cereals. That of the hills and mountains is also good, but the expense of ridding it of the timber forbids its use for cultivation.

Climate.—Del Norte, lying in the moist belt and on the ocean, has an invigorating and healthful climate. The average annual rainfall is between 60 and 70 inches. It rains some in every month of the year.

Agriculture and Stock.—Dairying is the principal industry (aside from the lumber interests), and little agriculture is carried on except for local demands—hay, barley, wheat, and vegetables. The annual shipments of butter are 600,000 pounds, mostly to the San Francisco market. The product is of the finest quality. Assessor's report for 1892 shows: Horses, 624; cattle, 4,543; hogs, 792; mules, 33; sheep, 1,279.

Horticulture.—Very little attention is paid to fruit raising, although the soil is favorable. Apples are the main crop, though plums and pears do well. Also, peaches to some extent are raised. The acreage in trees is, bearing, 114; not bearing, 36; total, 150; of these, 125 acres are apples, which are of fine keeping quality and fine flavor.

Timber.—There are 190,000 acres of redwood, besides tamarack forests and other timber. The annual shipment of lumber from Crescent City is 14,000,000 feet, and 2,000,000 shakes.

Mining.—This industry is carried on to some considerable extent, principally along the course of the Klamath River in the eastern part of the county, and in the neighborhood of Gasquet, 18 miles from Crescent City. Here are opportunities for prospecting for precious metals with good chances of success. Transportation facilities and ready communication with the outside world are mainly what is needed to vastly increase the productions of this county, whether in lumbering, dairying, or mining.

Manufactures.—Besides the lumber mills there are two salmon canneries, one near the mouth of the Klamath River and the other near the mouth of Smith River.

Prospects.—Government improvements on the harbor at Crescent City will greatly stimulate the development of the inexhaustible mineral, and timber, and agricultural resources of this naturally rich country.

EL DORADO.

El Dorado County is bounded on the north by Placer, east by State of Nevada and by Alpine County, south by Alpine and Amador Counties, and west by Sacramento County.

Statistics.—Area, 1,890 square miles, or 1,150,000 acres. Unentered Government land, about 350,000 acres. Lands assessed, 464,224 acres. Total assessed value of all property, \$3,860,855. Rate of taxation, State and county, 2.00. Number of miles of railroad, 30.55; assessed at \$244,543. County property, \$30,000. Total county debt, \$157,000. Number of schools, 57. School children between 5 and 17 years, 1,982. School money, \$31,313 72. Population, census of 1890, 9,206.

County Seat and Principal Towns.—Placerville, the county seat, has a population of 3,110. Other towns are Georgetown, population 700; Coloma, Kelsey, Greenwood, Pilot Hill, Grizzly Flat, Latrobe, Shingle Springs, Smith Flat, Mud Springs, and Diamond Springs.

Topography.—It is about 70 miles from east to west, and 35 miles from north to south. It varies in altitude from a level with the Sacramento plains at its western extremity, to 8,000 to 10,000 feet on its eastern boundary. On its western boundary is a belt of prairie land but slightly elevated above the plains; then succeeds the undulating hills and narrow valleys of the foothills, covered with white oak, live oak, chaparral, manzanita, and straggling pines. To this succeeds the mountain regions, thickly covered with the heaviest timber. Fully two thirds the area of the county is embraced by the upper foothill region, within a range of 1,500 to 2,500 feet altitude, well timbered with black oak, live oak, spruce, hemlock, fir, cedar, and many species of pine. Within these limits are produced abundantly cereals, vegetables, potatoes, Indian corn, clover, and all the deciduous fruits and nuts. The main streams of the county are the North, Middle, and South Forks of the American River, which joins the Sacramento River at Sacramento, and their tributary streams, affording the county immense water resources.

Soils.—The soils of El Dorado vary somewhat with altitude, from the black alluvium of the lower plains to the gravelly red soil of the foothills. Occasional streaks of adobe are found. The soils are unusually rich in plant foods, as shown by the abundant yield of cereals, fruit trees, and vines.

Irrigation.—No county of the State is better provided with water. There are three main companies, with 367 miles of ditch and flume, assessed at about \$270,000. Although these were originally built and are now extensively used for gold mining and mills, yet they still furnish abundant water for irrigation at reasonable rates, and cover all the main fruit districts. Owing to the large rainfall, however, and retentive character of the soil, but little water is required for irrigation.

Climate.—The climate varies with altitude. In the western portions the summers are hot like the other foothills of this section of the State, ranging sometimes from 95° to 110°. The air is dry and salubrious, and the nights invariably cool. The winter temperatures do not vary materially from that of Amador and Placer Counties. In the higher mountainous district the summers are spring-like and cool, and the winters severe, with heavy snowfalls and sharp frosts. Placerville and Georgetown sometimes have a little snow, but it seldom remains twenty-four hours. The annual rainfall of Placerville is about 43.19 inches, and of Georgetown 58 inches.

Agriculture.—Much wheat, barley, and hay are raised in the lower plains and foothills, but in the upper foothills mostly hay, grain, clover, vegetables, and corn for local consumption, or for use in the timber and mining regions higher up.

Horticulture.—El Dorado is rapidly advancing in fruit culture. Apples are an abundant and fine product around Georgetown, Greenwood, Kelsey, Placerville, and the higher foothills, and many tons are shipped to the valleys. Coloma produced in the early years the first peaches raised in the State. Peaches, plums, prunes, pears,

cherries, figs, grapes of all varieties, almonds, and walnuts are raised in the fruit districts. There is one orchard of 400 acres at Diamond Springs. The total acreage in fruits in El Dorado County is 2,525 acres, of which 2,023 are bearing and 502 not bearing. Of this acreage Coloma has about one third, Placerville one third, Diamond Springs and vicinity about one fourth, and the balance is scattering. About 200 carloads of green fruit, of 10 tons each, were shipped from this county in 1892, and a large amount was canned and dried—amounting to from 15 to 20 per cent of the yield. The olive is successfully cultivated in the county; oranges also do just as well as in Placer or Amador Counties.

Stock and Dairy Interest.—Cattle and sheep are extensively raised, being generally on two ranges—the lower for winter and the mountains for summer; and there is a large output of fine butter annually, which finds its market in the valleys and plains. The mountains furnish the most excellent summer range, with abundant grass and water. The Assessor's report for 1892 shows: Horses, 3,158; cattle, 10,337; hogs, 1,356; mules, 72; sheep, 4,835; goats, 2,974.

Timber.—The sugar pine forests of the mountains are immense and unsurpassed in the State. Many of the trees are 10 to 15 feet across and over 300 feet high. Yellow pine, fir, spruce, and cedar abound. There are a dozen large saw mills in the county.

Mining.—The gold mines, both quartz and gravel, are very extensive. The first discovery of gold was made in this county. The Mother Lode enters this county from the south and follows a course at 30° west for 20 miles. The total yield of gold to date is about \$100,000,000. Quartz mills now running, 43, with 485 stamps; gravel mills, 10, with 105 stamps. About 860 men are employed, with daily wages of \$2,580. Besides gold, there abound silver, copper, iron, marble, slate, and lime. Lime has been burned largely since 1853. There is considerable marble also, which takes a fine polish. The slate quarries on the South Fork of the American River, 3 miles from Placerville, are well and widely known.

Health and Pleasure Resorts.—The numerous beautiful lakes in the mountains afford a delightful summer resort for health, rest, and recreation; trout and game abound. The famous Lake Tahoe, 6,247 feet above sea-level, a noted pleasure resort, with fine hotels, steamers, and sail and row boats, lies partly in this county, though regularly reached by the Central Pacific Railroad via Truckee or the Summit.

Prices of Land.—Good land can be bought at from \$5 to \$20 per acre, according to quality and location, although in the improved fruit sections the prices are higher. For the industrious immigrant with limited means it affords one of the most inviting fields to be found in this State.

FRESNO.

Fresno County is bounded north by Merced and Mariposa, east by Mono and Inyo, south by Tulare, and west by San Benito and Monterey Counties.

Statistics.—Area, 8,093 square miles, or 5,600,000 acres. Lands assessed, 2,057,896 acres. Total assessed value of property, 1892, \$43,434,257. Rate of taxation, State and county, 1.23. Number of miles of railroad, 194.06; assessed at \$2,515,247. County property, \$805,500. County debt, \$95,000. Number of schools, 129. School children between 5 and 17 years, 8,141. School money, \$193,974 98. Population, census of 1890, 31,877.

County Seat and Principal Towns.—The county seat is Fresno City; population, census of 1890, 10,890. It has six banks, two daily and several weekly newspapers, three street car lines, paved streets, excellent water, gas, electric light and telephone systems, fire department, elegant public school and other buildings, churches, first-class hotels, elegant opera house, and all the improvements of a modern city. The High School building cost over \$50,000. It is also the manufacturing, shipping, and commercial center of the county. It is the geographical center of 1,000,000 acres of arable land. The population has increased 350 per cent in ten years. Over 4,900 carloads of freight were shipped from this city in 1891. It has five railroad lines centering there, giving communication with San Francisco north, Los Angeles south, east to the timber and mining sections of the county, west to the Coast Range, and southeast skirting the foothills to Sanger and Porterville. The Monterey and Fresno line will soon be started. The city has a Board of Trade and various other public organizations, enthusiastic in advancing the industrial interests of their great county. Its citizens are enterprising, pushing, business men.

Selma, 15 miles south of Fresno, population 2,000, is the center of a large fruit district, has fine hotels and public buildings, banks, flour and planing mills, and two newspapers.

Sanger, 15 miles southeast of Fresno, population 1,600, is the terminus of a large flume, with a capacity for bringing lumber from the mountains of 350,000 feet every eighteen hours. It has school buildings and churches, a bank, waterworks, electric lights, newspapers, mills, and warehouses. It ships about 1,000 cars of grain and 1,300 cars of lumber a year.

Madera, population 1,500, is the terminus of a 65-mile lumber flume, which brings enormous amounts of lumber from two large mills in the mountains, and is a thriving place, with excellent schools, fine churches, and substantial business buildings.

Other towns are Clifton, Easton, Fowler, Reedley, Oleander, Kingsburg, on the east side of the valley; and on the west side Ingomar, Volta, Los Baños, Dos Palos, Firebaugh, Mendota, and White's Bridge.

Topography.—Imagine a line running nearly from southwest to northeast through the center of the county; it would be 160 miles long. It would begin at the summit of the Coast Range, elevation 4,000 feet; running thence to the trough of the valley, elevation 180 feet; thence to Fresno City, elevation 295 feet, from which city there is a gradual rise to a point 22 miles east, where the elevation is 860 feet; thence 6 or 7 miles farther, to the Toll House, elevation 2,150 feet; thence to Stevenson's Creek, 6,000 feet altitude; thence the line crosses precipitous peaks and ridges, alternately, to an elevation of 11,000 feet, and then descends to the bed of the South Fork of the San Joaquin River, which is 8,000 feet altitude. From here the line is crossed by deep cañons until the eastern line of the county is met, at an altitude of 14,000 feet. From the south boundary of the county, in the center of the valley, elevation 200 feet, the valley falls on a gentle grade of about one foot in the mile to the northern boundary, altitude 145 feet. The San Joaquin River, rising in the mountains in the northeastern part of the county, flows southwesterly to the center of the valley, then follows the center of the valley northwesterly through the county. Kings River, coming from the mountains in the southwestern part of the county, on a course parallel with the San Joaquin, follows the southern boundary of the county, and finds its way to the low lands north of Tulare Lake, in Tulare County. In the entire central basin there are over 3,000,000 acres. From 3,500 feet to 6,500 feet elevation in the Sierra Nevada is found one of the most magnificent belts of sugar pine, yellow pine, spruce, fir, cedar, and gigantic sequoias, or big trees, in the State.

Soils.—The soils of the basin are of about six kinds, running in belts, parallel with the mountains. Near the foothills on the east a strip of black soil; from thence half way to the trough of the valley, red or chocolate loam; thence to the trough, gray ash soil; bordering on the marsh lands in the southern part is some alkali. Thence west of the San Joaquin River and trough, first a narrow strip of black adobe; thence clayey sedimentary to midway between river and foothills; thence sandy wash soil to base of Coast Range. All these soils are first class.

Climate.—The climate of the valley is dry and healthful, very warm by day, with cool nights in summer and delightful the balance of the year. At Fresno City the mean yearly temperature is 66.9°; highest temperature, 112°; lowest, 29°; mean summer, 79°; mean winter, 57½°. The temperature gradually lowers as you ascend (eastward) the foothills and mountains. Average annual rainfall, 8.79 inches.

Irrigation.—There are 18 main irrigating canals, with their numerous laterals, covering about 500,000 acres of tillable land. The West Side system takes water from the San Joaquin. The value of land without water rights ranges from \$5 to \$10 per acre; of irrigated lands, from \$40 to \$100 per acre. The annual cost of abundant water for irrigation is from 62½ cents to \$1 per acre. The production before irrigation, 10 cents an acre; since irrigation, \$50 to \$300 an acre. Twenty years ago you had to dig 70 feet deep for well water; now in the irrigated districts you strike it at about 10 feet. This subterranean water level is not stagnant, but flows off continually, owing to perfect drainage of the soil. Lands on the West Side under the ditch canal are worth on an average about \$60 per acre for colony purposes. Artesian water is struck in some places on the West Side, but none is generally found at a surface altitude above 275 feet above sea-level. There are about 4,000 miles of canals and ditches, both main and laterals.

Agriculture.—Fresno is great in agricultural products. Her grain crop of 1891 was 175,000 tons, valued at \$3,200,000. Her estimated exports of wheat, barley, corn, oats, hay, flour, mill stuffs, and vegetables amounted to nearly 217,000,000 pounds. Her hay crops are immense, and her extensive alfalfa fields yield five crops a year. She will naturally, for many years, be a large producer of cereals, vegetables, and stock feed.

Horticulture.—Fruit culture is the leading industry of the people. Raisin growing receives by far the greatest amount of attention, followed sharply, however, by the production of all deciduous and citrus fruits, in about the following order: peaches, prunes, apricots, pears, figs, nectarines, olives, apples, and plums, then almonds, walnuts, oranges, and lemons. The bearing acreage in raisin grapes is 35,900; the non-bearing, 8,000 acres. Acreage in fruit trees: bearing, 3,274; non-bearing, 2,725.

The principal fruit and raisin districts are Fresno and environs, Selma, Fowler, and Madera. Several of the largest vineyards and wineries of the State have become established here. The yearly output of wine and brandy has averaged for several years nearly 3,000,000 gallons. Wine grapes in this section show the phenomenal product of 10 to 14 tons in some of the best vineyards. But the plantings have turned more to the Muscat grapes for raisins, for the growth of which, in abundant quantities and of fine quality, these alluvial soils are eminently adapted. The climate also being so warm and dry, day and night, for so long and safe a period after harvest, provides the best conditions for curing. After overcoming many obstacles, the raisin industry has grown from an output of 4,000 twenty-pound boxes in 1880, to over 1,000,000 boxes in 1891. At the present rate of increased planting, in four or five years the output should be between 3,000,000 and 4,000,000 boxes. Besides the raisin crop, a large deciduous fruit product is shipped from Fresno yearly, either green for the Eastern and San Francisco markets, canned, or dried.

Citrus fruits are raised very successfully and of the finest quality. There are over 50,000 orange trees in the county, the best districts thus far experimented on being found from Fresno south toward Sanger and beyond on the railroad line to Porterville. Large orchards will no doubt be planted in the thermal belt in the next few years.

Fig culture is extensively engaged in, especially the White Adriatic fig, which is the best drying white fig yet found to compete with the foreign Smyrna. Large shipments have been made with the most satisfactory results.

The segregated fruit shipments from different sections are hard to obtain at an early date after the close of the year, but the shipments of fruit products from Fresno County for 1890 were 44,740,428 pounds. In 1891, 1,200 carloads of raisins were shipped. More than one half the raisins of California are produced in this county. The statistics for 1892 are not obtainable.

Stock, etc.—There are over 100,000 cattle and 500,000 sheep in Fresno County, and it is a favorite section for the production of fine horses. As the natural ranges on rivers and moist lands in winter, and in the mountains in summer, become limited, the lack of feed is gradually being supplied by the growth of large areas of alfalfa, which makes stock growing more profitable than the old method. A well established alfalfa field is estimated to be worth from \$100 to \$150 an acre for stock-raising purposes. The shipments of cattle, horses, hogs, and sheep, hides and wool, for 1890, amounted to over 31,000,000 pounds. The wool shipments amounted to 5,582,035 pounds. The Assessor's report for 1892 shows: Horses, 22,315; mules, 3,513; cattle, 52,295; hogs, 11,082; sheep, 386,941; poultry, 6,190 dozen.

Timber.—In the eastern part of the county, from north to south, and included between the elevations of 3,500 feet to 6,500 feet above sea-level, is to be found one of the finest bodies of timber in the State. Vast forests of sugar pine are here, also yellow pine, fir, spruce, hemlock, and cedar. Here, also, are portions of three national parks, containing scattered Big Trees, or *Sequoia gigantea*, some of them 25 to 45 feet in diameter, and 350, 400, and even 500 feet high. The Fresno Grove probably has one hundred or more of these giants. The southern part of Yosemite Park and the Sequoia National Park contain many more. Lumber is cut in the mountains and brought by immense V flumes from 40 to 60 miles, to both Sanger and Madera, the latter flume being the longest in the world. There are about fifteen mills, seven showing a product of 32,700,000 feet, for 1891. The Sanger flume has a carrying capacity of 350,000 feet a day. The estimated value of the Fresno County timber, at \$10 per thousand, is \$80,000,000.

Mining.—The mineral resources of Fresno County include gold, silver, copper and iron, bismuth and antimony, magnesite, gypsum and limestone, bituminous and lignite coal, petroleum, etc. Mining is extensively carried on in the mountains and higher foothills, principally for gold. The Mother Lode is traced also through Tuolumne and Mariposa into this county. Some of the gold mines are being worked, and many others are now idle. Iron deposits in large quantities are found in the Minaret and Mount Raymond districts of almost inexhaustible quantity, and 64 to 66 per cent pure quality, magnetic and specular hematite. Thousands of tons could be mined at a nominal rate. Copper deposits are also abundant. Gypsum is found in abundance in the Coast Range, near the Huron and Alcalde branch. Lignite and bituminous coal is found in the vicinity of and northwest from Coalinga, in the Coast Range; there is very little development of the deposit. Petroleum is found in the Oil Cañon, 8 miles north of Coalinga; many locations are made, but no deep borings. Natural gas flows in many sections. There are several granite quarries, of fine quality of stone, being worked in the vicinity of Raymond. Chromite, antimony, and limestone are also found, the latter in three townships 40 miles northeast of Fresno City. There is freestone of dark slate color near Huron.

Manufactures.—The manufactures of Fresno County embrace manufactured lumber, flour, mill stuffs, canned fruits, raisins, wine and brandy, doors, sashes, and blinds, fruit boxes, agricultural implements, and machinery.

Exports.—The total exports of Fresno County in 1892, of raisins, fruits, cereals, stock, wool, lumber, and other products, reached nearly \$10,000,000 in value.

Colonies.—The colony system, prevalent in this county, necessitating the cutting into small tracts, bringing under irrigation and improving the before undivided lands, has greatly stimulated the immense fruit production of Fresno, and been mainly instrumental in the great increase in the number of farms from 926 in 1880, to 2,352 in 1890. The district on the west side of the valley is yearly attracting more attention, and the successful and prosperous colonies inaugurated near Dos Palos, Los Baños, and in other west side localities, under the splendid irrigating system of the West Side Canal, show what splendid results are to be expected in the way of fruit raising in this fertile section.

GLENN.

Glenn County is bounded north by Tehama, east by Butte, south by Colusa, and west by Mendocino Counties. Its recent segregation from Colusa County necessitates an estimate of some of the statistics.

Statistics.—Area, about 1,200 square miles, or 768,000 acres. Lands assessed, 603,908 acres. Total assessed value of all property, \$12,025,442. Rate of taxation, State and county, 1.35. Number of miles of railroad, 45.70; assessed at \$365,814. Value of county property, \$2,600. County debt (floating), \$17,591 65. Number of schools, 44. School children between 5 and 17 years, 1,459. School money, \$28,232 19. Population of old Colusa, under census of 1890, was 14,640; Glenn County, segregated since then, is estimated at 6,264.

County Seat and Principal Towns.—The county seat is Willows; population, 1,176. It is located at the junction of the S. P. and W. & M. railroads, the latter being a branch running to Fruto, and about 10 miles west of the Sacramento River. It is lighted by electricity, has waterworks, a bank of \$300,000 capital, fine school buildings, churches, and business blocks, and is the commercial center of a splendid section of agricultural land within 40 miles radius around it.

The other towns of the county are Orland, population 450; Butte City, population 350; Germantown, Newville, Elk Creek, Princeton, and Jacinto. At the terminus of the W. & M. Railroad is located the colony of Fruto, devoted to the horticultural development of that section.

Topography.—The topography, soil, and climate of Glenn County is very similar to that of Colusa County, heretofore described in detail. The eastern portion consists of level plains and valley lands, which are changed into rolling hills in the western portion, becoming more elevated and precipitous as you proceed westward, until they terminate in the mountains of the broken Coast Range. It is, however, in its great extent, a Sacramento Valley county. Stony Creek, a considerable stream rising in the Coast Range,

runs easterly, dips north into Tehama County, then easterly again through northern Glenn County to the Sacramento River.

Irrigation.—Water for irrigation is taken from Stony Creek for the districts tributary to Orland, but the main supply for this purpose, for Glenn as well as Colusa County, comes from the great canal which starts from the Sacramento River about 10 miles north of Willows and extends south for 40 miles, a fuller description of which has been given under the caption of "Colusa County."

Soils.—The soils do not vary materially from those of Colusa County, to which reference is made for a description of the particulars. Its great fertility, which it shares with Colusa County, and which helped to make the great grain-growing record of the old county as the largest producing wheat county in the world, will one day, not very far distant, give astounding results in its cereal and fruit output.

Agriculture.—The county is, of course, mainly devoted to the growth of wheat, distributed throughout the various sections of the county, of which the before enumerated towns are the agricultural and commercial centers, owing their business existence solely to this branch of agriculture.

Horticulture.—In many portions of these districts orchards and vineyards have been planted and colonies started to engage in fruit culture, among which may be mentioned Fruto as the terminus of the W. & M. Railroad. About 300 acres have been set out to fruit the past three years, and the growth of these trees and vines has been remarkable. Enough has been shown to prove the adaptability of this county to a large and profitable production of all varieties of fruits. The principal products now are peaches, apricots, and prunes; apples, pears, walnuts, almonds, and oranges also flourish, according to proper selection of soil and site. There are 2,408 acres planted to fruit, of which 1,552 are bearing, and 856 not yet bearing.

Stock.—There are wide areas in the foothills preëminently adapted to stock raising, where large bands of cattle, horses, and sheep graze the entire year. Before the plow touched these tracts, wild oats were found as high as a horse's back, native clover grew thick and tangled, and the hills were covered with nutritious bunch grass. Much fine stock is raised in this county, and there is a large output of dairy products. The Assessor's report for 1892 shows: Horses, 4,527; mules, 3,134; cattle, 5,262; hogs, 10,000; sheep, 38,182; goats, 221; poultry, 1,462 dozen.

Lands.—Most of the lands of Glenn County are held in large tracts, devoted to grain raising, and the non-division of these tracts has of course retarded the settlement of the county with a numerous population. Lands can be bought at reasonable prices in any of the districts, ranging from \$10 to \$50 an acre, according to situation and quality.

Climate.—The climate is precisely similar to that of Colusa County. At Willows, for 1890 the average annual temperature was 59.4°; the highest summer, 108°; the lowest winter (or rainy season), 28°. The rainfall per year, 15.81 inches.

Timber.—There are a number of saw mills in the mountains, but their product is mainly for the supply of the home demand.

HUMBOLDT.

Humboldt County is bounded north by Del Norte and Siskiyou, on the east by Siskiyou and Trinity, on the south by Mendocino County, and west by the Pacific Ocean. Its coast-line is about 175 miles.

Statistics.—Area, 3,590 square miles, or 2,297,600 acres. Lands assessed, 1,293,685.41 acres. Total assessed value of all property, 1892, \$18,014,237. Rate of taxation, State and county, 1.10. Number of miles of railroad, only used for logging camps and lumber to the bay, 63 miles. County property, \$275,000. County debt, \$74,000. Number of schools, 131. School children between 5 and 17 years, 5,999. Public school money, \$123,383 19. Population, census of 1890, 15,510.

County Seat and Principal Towns.—The county seat is Eureka, situated on Humboldt Bay, 216 miles from San Francisco, population 4,834, census of 1890; but since then the city limits have been extended, and a careful estimate gives the present population as 7,700. It has three banks, four newspapers, nine churches, splendid school buildings, opera house, six saw mills, and numerous factories and shipyards. It has a good sewer system, water, gas, and electric light plants, two miles of street car line, and fine public



REDWOOD STUMP, 22 feet in diameter; Humboldt County. Photographed by A. W. Ericson, Arcata.

and business buildings. Its Court-house grounds, buildings, and furniture are valued at about \$225,000, and its Infirmary at \$40,000. Eureka is the entrepot and shipping point for the county, and handles an immense amount of lumber, fish, dairy products, vegetables, fruit, and supplies yearly. Two lines of steamers give semi-weekly connection with San Francisco, and over 125 vessels are engaged in trade on Humboldt Bay, carrying over 700 cargoes a year. The appropriation by Congress of \$1,750,000, for the completion of the improvements on Humboldt Bay, has awakened intense interest in the county, and all industries have felt the beneficial stimulus toward further development of the great resources of this section.

Arcata is the second town in importance, population 2,000, with four churches, schools, water and gas works. The other towns are Fortuna, Alton, Ferndale, Rohnerville, Port Kenyon, Hookton, Trinidad, Hydesville, Table Bluff, Petrolia, Springville, Blocksburg, and Garberville, all thriving towns with attractive points.

Topography.—The topography of this county exhibits the most varied character. The Coast Range of mountains, which is here very much broken up and dispersed, is the source of a large water supply, affording Eel River, with seven or eight tributaries on the south, Trinity River, with four or five tributaries in the middle, and the Klamath River on the north. The latter is next to the largest river in the State, being over 250 miles, and including its main tributaries 1,000 miles long, a mile wide at its mouth in Del Norte County, where it empties into the ocean just north of the Humboldt County line, and drains five counties in California and two in Oregon. There are also numerous short streams along the coast, emptying directly into the Pacific Ocean. The land surface is extremely rugged, innumerable spurs of the Coast Range intersecting the county in all directions. There are a great number of well watered small valleys in the interior, but the chief level land lies around Humboldt Bay. The mountains are densely covered with immense growths of redwood timber of colossal size. The subdivisions of area are, approximately: timber land, 938,000 acres; agricultural, 450,000 acres; grazing, 500,000; marsh, 31,285; mineral lands, 125,000, and unclassified, 235,315 acres.

Soils.—The soil of the valleys, and extending well up into the hills, is very fertile. On the bottom lands and next the coast it is black, that on the bottoms being of a sedimentary character, while that of the hills is more of a sandy loam. The soil of the interior hills is composed of disintegrated rock, mixed with organic matter from decayed vegetation. The best soils for agricultural and horticultural purposes are found chiefly in the Eel River valleys, the Klamath River country, and around the bay.

Climate.—On the coast the temperature is uniformly cool and pleasant, ranging from 60° in summer to 48° in winter. In the interior the range from winter to summer is much greater, running up sometimes to 100°. The freezing point is seldom reached in winter in the interior valleys. It never snows except in the highest valleys and at the heads of streams, but snow falls on the mountains back of the timber belt, sometimes to a depth of several feet. Almost any variety of climate can be found in the county. The average annual rainfall is about 40 inches.

Irrigation.—As a natural result of the great annual rainfall, artificial irrigation is not required.

Agriculture.—Although making no pretensions to being a grain county, Humboldt raises abundant crops of oats, barley, hay, potatoes, peas, beans, and other agricultural products. She exported \$45,000 worth of potatoes in 1890, and has long been noted for her output of this crop. Of oats she exports about \$50,000 a year, and her large shipments of dairy products show an immense yield of hay and clover to produce such results. One of the best farming sections is the Hoopa Valley, which is now a Government reservation for the Indians.

Dairying is a most important industry in this county, the annual exports of dairy products being over \$350,000 in value, in butter amounting to over 2,000,000 pounds. There are eight large creameries and many cheese factories in the dairying districts. The introduction of red clover greatly stimulated this industry.

Stock.—The raising of stock has always been an important business, and has proved very successful and remunerative, both in cattle, horses, and sheep. The exports of 1890 show wool to the value of \$300,000; hides and leather, \$50,000. The annual wool clip is over 900,000 pounds, from over 150,000 sheep. The Assessor's report for 1892 shows: Horses, 6,728; cattle, 40,165; mules, 716; hogs, 5,089; sheep, 97,533; poultry, 1,809 dozen.

Horticulture.—Much attention is being given to fruit raising, though the lack of transportation facilities has made it difficult to reach outside markets with any fruits except apples, which are here produced of the very finest varieties and excellent quality; her shipments of these reaching annually a value of over \$30,000. There are many sections, however, well adapted to fruit raising, the principal districts where plantings are found being Ferndale, Rohnerville, Camp Grant, McDarmidt, Blocksburg, Upper Mattole, Arcata, Bottom, Eel River Valley, Garberville, and Phillipsville. Fruit shipped from Humboldt in 1891 was: apples, 740,000 pounds; peaches, 60,000; prunes, 10,000; cherries, 16,000; pears, 10,000; plums, 2,500; total, 838,500 pounds. These shipments furnish a fair estimate of the relative importance of the varieties. Grapes of all kinds do exceedingly well; also, the small fruits, strawberries, raspberries, and blackberries. The fruit acreage, so far as can be arrived at, is 1,372, of which 1,044 acres are bearing and 328 not bearing. Doubtless further experiments will prove the adaptability of the soils to many other varieties, when a foreign market is more easily reached, and the county has the stimulating connection by railroad with the outside world.

Timber.—The leading industry of the county is the manufacture of redwood lumber, shingles, shakes, and other timber products; the annual exports in this line reaching over \$3,500,000, represented, in 1890, by lumber, 126,957,510 feet; shingles, 261,821,650; shakes, 17,057,919; doors and windows, 31,600; moldings, 2,700,000 feet. In 1892 the product was, lumber, 158,250,660 feet; shingles, 177,550,320. This industry is based on a timber belt of gigantic redwood trees, extending throughout the mountains of the county from north to south, and averaging 12 to 13 miles wide, embracing over 700,000 acres. There is also over 200,000 acres of pine, spruce, and cedar, and 200,000 acres of white oak, madrona, and other woods. There are twenty-nine immense mills in operation, and upwards of 3,000 men are employed in the logging season, at wages from \$30 to \$200 per month. The great development of this lumber interest explains the prosperity of this county, in spite of its lack of railroads.

Ship-building is a prominent industry, giving employment to 300 men. There are several shipyards, a marine railway, and all the appliances of this science. In the last ten years 2 steamers, 6 barkentines, and 33 schooners have been built, and during the past year 3 schooners, 2 barkentines, and 1 steamer.

Fishing.—The steady development of salmon fishing in Eel River engages many men, and distributes annually about \$75,000.

Manufactures.—The manufactories are principally lumber, shingle, and planing mills, sash and door factories, tanneries, canneries, cheese factories, creameries, and others for the various products dependent upon these principal ones locally in so industrious and prosperous a community.

Minerals.—The golden sands of the coast are worked in a small way, about \$75,000 being reported annually. On the Klamath and Trinity Rivers are large deposits of gold-bearing gravel awaiting development. Coal has been located in sixteen localities. In the Mattole section some petroleum developments have been made. Two companies are putting down wells with splendid indications, one of them being 2,500 feet. Copper and other minerals are also found. Though this has not hitherto been much of a mining county, there is no predicting what results future developments may show.

Prices of Land.—Good agricultural lands in this county range from \$10 an acre for unimproved, to \$100 for highly improved tracts—also, according to location. The man of limited means can do well here in building a home.

INYO.

Inyo County is bounded on the north by Mono, south by San Bernardino, west by Fresno and Tuolumne Counties, and east by the State of Nevada. It is 120 miles long and 60 miles wide, and the third largest county in the State.

Statistics.—Area, 10,156 square miles, or 5,196,000 acres. Unentered Government land, 4,500,000 acres. Lands assessed, 153,161 acres. Total assessed value of all property, \$1,543,532. Rate of taxation, State and county, 2.00. Number of miles of railroad, 74.25; assessed at \$158,683. County property, \$15,000. County debt, \$70,860 43. Number of schools, 14. School children between 5 and 17 years, 682. School money, \$12,357 40. Population, census of 1890, 3,544.

County Seat and Principal Towns.—Its county seat is Independence, which has two newspapers, churches, school buildings, and many handsome buildings. Bishop Creek is centrally located in a well-watered and fertile valley of about 150 square miles. The Carson and Colorado Railroad runs from Carson City, Nevada, south through Mono and Inyo Counties, through Independence and Bishop Creek to Keeler, near the northern border of Owens Lake.

Topography.—Inyo is the most mountainous county in the State. It lies east of the Sierra Nevada range, which here attains its highest elevation and the valleys their greatest depression. It is a county of rugged, snow-capped peaks, of great height, among which may be named Mount Whitney, 15,000 feet; Mount King, 14,000; Mount Tyndall, 14,386; Mount Williamson, 14,500; Mount Inyo, 15,000, and Mount Abbott, 12,400. The eastern slope of these mountains is so precipitous as to shut out all direct communication with the western part of the State to which this county belongs. Death Valley lies about 60 miles east of Owens Lake, which is about 40 miles long by 8 to 10 miles broad, and shows a depression below sea-level of 400 feet, as reported by the boundary expedition of 1861. The Inyo range runs north and south, and the Panamint range parallel therewith and still higher, lying to the east. The only available body of agricultural land is Owens Valley, which is about 95 miles in length, with a belt of arable land of from 2 to 8 miles in width. Through this valley runs the Owens River, rising in the Sierra Nevada and running south 150 miles into Owens Lake. It carries a volume of water 50 feet wide, with an average depth of 6 feet, and a velocity of 5 miles an hour.

Irrigation.—The irrigation ditch, now only partially complete, will cover about 50,000 acres of agricultural land. Water also comes in good supply by creeks from the Sierra Nevada on the west. There are 64 miles of irrigating ditches complete, valued at \$8,100.

Soils.—The soil of this valley is quite fertile and produces cereals and fruits.

Climate.—The climate of Inyo presents a wide range, the temperature varying in the valley, from records kept at Keeler, from maximum summer temperature of 105°, to lowest winter of 21°, through six years' observations; the average for summer being about 74°, and for winter about 50°. The average annual rainfall for same period is 3.46 inches.

Agriculture.—Agriculture is limited to home consumption.

Horticulture.—The number of orchards and vineyards is small, varying from 2 to 5 acres each in extent. They are mainly for home consumption and the mines. Excellent apples are grown here, and peaches, pears, grapes, and small fruits do well where properly cared for. The total acreage in fruit reported is 491, of which 326 are bearing and 165 not bearing.

Stock.—Stock raising is carried on to a limited extent, the assessment reports showing 5,718 horses, 14,529 head of cattle, 908 hogs, 385 mules, 5,250 sheep, and 7,025 goats. Dairying is confined to the supplying of local demands.

Timber.—The timber product is not extensive, mainly for mining and fuel supply.

Mining.—The majority of developments so far have been in the way of silver, the ores produced being principally argentiferous galenas, difficult and expensive to reduce, in this locality, on account of scarcity of fuel. Many mines have formerly been worked in the Cerro Gordo, Keeler, Owens Lake, Kearsarge, and Independence districts, but the remoteness from railroad facilities, the low price of silver, and the refractory character of the ores have retarded development. The prospective extension of the railroad south to a junction with the A. & P. R. R., in San Bernardino County, when accomplished will greatly stimulate prospecting in this district.

A very fine quality of marble is found and has been quarried to a considerable extent and used in many fine buildings in San Francisco. Soda, borax, and sulphur are found in inexhaustible quantities, and many tons are shipped annually.

Prices of Land.—Prices of land range from \$1 25, Government, to \$10 and \$20 for good land. Improved land is worth more.

KERN.

Kern County is bounded north by Tulare, east by San Bernardino, south by Los Angeles and Ventura, and west by San Luis Obispo County.

Statistics.—Area, 8,100 square miles, or 5,137,920 acres. Lands assessed, 1,824,843 acres. Total assessed valuation of all property, \$13,329,064. Rate of taxation, State and county, 1.45. Number of miles of railroad, 202.51; assessed at \$1,578,739. County property, \$48,-

000. County debt, \$20,000. Number of schools, 58. School children between 5 and 17 years, 2,225. Public school money, \$91,764 67. Population, census of 1890, 10,031.

County Seat and Principal Towns.—Bakersfield, the county seat, population about 4,000, is a rapidly growing place. Kern City, adjoining it, is practically one with it. The city is on the Southern Pacific Railroad, 314 miles from San Francisco, and 170 miles from Los Angeles. It is well provided with gas, electric, and water works, street car lines, fine public buildings, churches, public schools, and substantial hotels and business blocks. A large number of elegant residences have been erected the past year. Delano, Rosedale, Mojave, Caliente, Kern, Miramonte, Havilah, Kernville, and Greenwich are other important towns among many in the county.

Topography.—The county lies at the southern extremity of the San Joaquin Valley, where the Sierra Nevada and Coast Range join. About one third its area lies in the San Joaquin Valley, and is called the Kern Delta, being inclosed on the east, west, and south by mountains, and open toward the north. The 1,500,000 acres of valley land slopes gently from east to west about 7 feet to the mile to its lowest depression, then rises gradually till it meets the Coast Range. Among the mountains are numerous fertile valleys devoted mainly to cereals and stock, the chief of which is Tehachapi and South Fork of Kern River, containing 30 to 40 square miles of arable and irrigable land. The county also includes a part of the Mojave Desert, in the southeast corner below the Tehachapi range. The county ranges in altitude from 300 feet in its lowest part to 10,000 feet in the Sierra Nevada. The richest agricultural lands lie in the central portion of the county, which at one time was a region of desert and marsh, but it has been reclaimed by a system of irrigation and drainage. The section, extending about 35 miles north by west, had originally a drainage by Kern Lake and Buena Vista Slough to Tulare Lake. Buena Vista Lake has been converted into a reservoir for storage water for summer irrigation, and the diversion of Kern River has transformed former lakes and marshes into arable land. The principal streams are Kern River and Poso Creek, which supply the grand irrigation system of the county. Kern River ranks as third in size of the rivers of the San Joaquin Valley. It rises in the Sierra Nevada Mountains in Tulare County, having two large forks flowing southwesterly 100 miles. It has a catchment area of 2,383 square miles, giving it a flow in time of floods of 20,000 cubic feet per second.

Soils.—The soil of Kern County varies from some comparatively worthless to much of unsurpassed fertility. The valley lands of the county represent the accumulation for countless ages of the richest elements of plant food. Much of it is similar to the famous white ash soil of Fresno. This is varied with a fine loamy sand, easily worked, very deep, and remarkably fertile under irrigation. Occasional streaks of adobe or clayey soil are found, with here and there patches of alkali. The soil, plainly charged with iron, grows reddish in tint near the foothills, and is of the same character as the land which produces the highly colored oranges of some portions of Southern California. The soil in the small mountain valleys is usually a black loam, well adapted to apples, pears, potatoes, and other vegetables. In the higher foothills there is a large admixture of gravel.

Climate.—The climate of the county, like that of others in the San Joaquin Valley, varies from plain to mountain. In the winter the arctic rigor of the mountains is separated from the perpetual mild spring of the valleys by only a few hours' ride. The average temperature at Bakersfield is, spring and fall, 65°; winter, 50°; summer, 85°. The highest recorded extreme of the valley is 118°, and the lowest 16°, both extremely rare, especially the lower one. The hot days are relieved by cool nights, as well as by the extreme dryness of the air. The annual average rainfall is only 5 inches, a shortage for which nature has provided abundant compensation in the deep snows of the mountains, thus providing an inexhaustible supply for the vast system of irrigation, which is the distinguishing feature of the county.

Irrigation.—This system is the most extensive and costly in the United States. The combined length of main canals and laterals is over 1,500 miles. The largest of these, the Calloway, diverted from Kern River about a mile and a half northeast of Bakersfield, is 120 feet wide on top, 80 on the bottom, and 7 deep. It has a grade of four fifths of a foot per mile, runs northeast for 32 miles, and supplies water for 200,000 acres. Sixty-five distributing ditches are taken from this main at different points, having an

aggregate length of 150 miles, and varying in width from 8 to 20 feet. For a long time irrigation in this county was restricted to the diversion of water from Kern River by small ditches and for short distances only, until, convinced of the immensely increased value and productiveness given to these fertile soils by the application of water, the means and energies of enterprising capitalists and large land owners of the county were liberally contributed to the construction of this splendid system, which constitutes to-day at once a tribute to their foresight, and the chief cause of the present unexampled prosperity of the agricultural and horticultural interests of the county. The expenditures in this connection have exceeded \$4,000,000. Much of the land under this system is held by certain capitalists, and is offered for sale in small tracts, at low prices, and on the most advantageous terms, and it will not be long before the whole will have passed into the hands of small holders.

Agriculture.—Cereals are largely produced, both in the valleys and on the higher levels. Wheat growing is the leading industry of Tehachapi. Barley, oats, and rye are raised to some extent, and Indian corn is extensively cultivated in the valley, growing to an astonishing size. Alfalfa is the standard feed crop, growing on the irrigated lands with unsurpassed luxuriance, and yielding from three to seven crops a season, of two tons at each cutting to the acre. The Assessor's report for 1892 gives: Sowings of wheat, 40,000 acres; oats, 500; barley, 10,000; corn, 2,000; hay (grain), 1,500. The rich irrigated soils are well adapted to hops, tomatoes, melons, and all varieties of vegetables. The rail shipments of grain for 1892 were 18,130,000 pounds; hay, 5,116,000 pounds, and potatoes, 1,868,000 pounds.

Horticulture.—In common with other adapted localities, Kern County has of late years turned her attention largely to fruit culture. Under the influence of complete irrigation, loose, easily worked, deep soils, and perfect climatic advantages, the growth of the industry has been rapid and the results marvelous. Very large areas are now being set to fruit, and this promises to be the leading business of the future. The peach here attains enormous size, and the trees bear profuse crops. Prunes, apricots, nectarines, plums, and berries yield abundantly, while the vineyards of raisin and table grapes produce as lavishly in amount and as excellently in quality as in the adjoining counties of Tulare and Fresno. Bartlett pears are an excellent crop, and apples do well in the mountain valleys and higher foothills. The total acreage in fruit trees and raisin and table grapes is 9,192, of which 7,386 are in bearing and 1,806 not bearing. The shipments of green fruits by rail in 1892 were 1,244,000 pounds; raisins, 326,000 pounds. The chief fruit regions are Bakersfield, Delano, Rosedale, Onyx, Weldon, Kernville, and Glenville. At Miramonte the fig has no superior in the State. The fruit output of the county will be immensely increased in the next two years. Most of the fruit of Kern is shipped in the dried form, which is preferred by many.

Stock Raising.—Stock ranks, in Kern, among the greatest sources of wealth. Thousands of head of stock are raised on the rank feed of the plains. In addition to this there is a large extent of natural range. The best blooded stock is found in this county. The rail shipments of stock, hides, and wool for 1892 were 40,300,000 pounds. The Assessor's report for 1892 shows in the county, 9,193 horses, 74,685 cattle, 5,326 hogs, 1,053 mules, 423,588 sheep, 485 goats, 1,120 dozen poultry—probably 75 per cent of the exact number. The value of the shipments by rail for eleven months, ending December 1, 1892, was: Cattle, \$772,240; horses, \$140,000; sheep, \$202,000; hogs, \$63,000; total, \$1,177,240.

Timber.—Aside from the heavy growth of oak in the foothills, useful for fuel, there are in the mountains large forests of pine, redwood, cedar, fir, spruce, and hemlock, extending the entire length of the county, and several saw mills are at work among them.

Mining.—The gold fever of 1849 extended to this county. Gold and silver mining are still successfully prosecuted in the mountains. There are numerous deposits of baser metals awaiting the advent of railroad transportation, capital, and population for their development. Petroleum and asphaltum are produced largely in the Sunset or Hazelton District, about 35 miles southwest from Bakersfield, sufficiently to have justified the building of a branch railroad by the Southern Pacific Company, with terminus at Asphalto.

Advantages.—No county offers superior advantages to settlers. There is a considerable movement in settlement and a colony system for the subdivision of large holdings.

It has the "greatest irrigated farm in the world," the largest irrigating canals in the State, the most extensive alfalfa fields ever planted, and the largest continuous body of arable land in California. Extensive experiments in every department of agriculture and horticulture have been carried out, of which the settlers have the fullest benefit. It has an abundance of water for irrigation, perfect climate, rich soil, and ample transportation facilities.

LAKE.

Lake County is bounded on the north by Mendocino, east by Colusa and Yolo, south by Napa and Yolo, and west by Mendocino and Sonoma Counties.

Statistics.—Area, 1,078 square miles, or 704,000 acres. Unentered Government land, 200,000 acres. Lands assessed, 295,333 acres. Total assessed value of all property, \$3,874,962. Rate of taxation, State and county, 1.65. County property, \$17,500. County debt, \$47,800. Number of schools, 44. School children between 5 and 17 years, 1,641. School money, \$27,037 12. Population, census of 1890, 7,103.

County Seat and Principal Towns.—The county seat is Lakeport; population, 996. It is beautifully located on the shores of Clear Lake, with two banks, two newspapers, and fine county buildings and business blocks. The principal towns are Upper Lake, Lower Lake, Kelseyville, and Middletown.

Railroads.—Though this county has hitherto been destitute of railroad connections, the S. F. & N. P. R. R. has recently been built to Ukiah, Mendocino County, and arrangements are being made for extension to Lakeport, a distance of 16 miles, bringing it within six hours of San Francisco.

Topography.—Lake County, while not possessing such lofty and precipitous mountains as other mountain counties, has often been called the Switzerland of America, with its hills of varying altitudes, some 4,000 feet high, its lovely lakes and its enchanting valleys. Uncle Sam, a mountain at the foot of Clear Lake, is an extinct volcano. The county lies between two broken ridges of mountains, the Myacamas on the west and the Bear Mountains of the Coast Range on the east. The larger part of its area is mountainous or hilly, but there are numerous fertile valleys among its hills. At the southern extremity is Mount St. Helena; at the northern, Mount Hull; in the center, Clear Lake, a magnificent sheet of water 6 miles by 25, at an elevation of 1,330 feet above the sea, skirted on its eastern shore by high but not abrupt mountains, and on its western shore almost bisected by Mount Konocti, or "Uncle Sam." The principal valleys are Big Valley, on the southwestern shore of Clear Lake, comprising 2,500 acres and watered by three streams; Scott Valley, along Scott Creek, with 7,000 acres; Bachelor Valley, north and west of the lake, with 3,000 acres; Upper Lake Valley, north of, and Lower Lake Valley, south of the lake, the latter being formed by the union of Coysey and Seigler Creek Valleys. Coyote Valley, in the southern part of the county, contains 15,000 to 20,000 acres of fine land. Besides these are Burns, Cobb, Capay, Clover, Donovan, and a host of others, all fertile, productive, and well watered.

Soils.—The soil of these valleys is rich alluvium, of great depth and rare fertility. The hills surrounding them have a large admixture of gravel, but in many cases the soil is of great depth and very retentive of moisture. It is all excellent for all kinds of fruits.

Irrigation is unnecessary in this county, owing to generous rainfall and retentive soil.

Climate.—The climate of Lake is charming, the winters not severely cold nor the summers oppressive. Flowers usually bloom all winter. During summer there are gentle afternoon breezes, and almost invariably cool and refreshing nights. Fogs are rare and chilling winds unknown. We have access to no records of temperature, but the average annual rainfall is about 32 inches.

Agriculture.—The agriculture is mostly for local demand, owing to lack of transportation facilities, yet large quantities of cereals are raised in the numerous fertile valleys. The main crops are wheat, barley, oats, corn, hops, potatoes, and all vegetables. Hops are an especially profitable crop.

Horticulture.—The fruit industry is yearly attracting more attention in Lake County, owing to the great adaptation of the soils of its numerous valleys and the hillsides bordering them. The principal products are apples, prunes, peaches, and pears, though

olives and grapes do exceedingly well. This industry will be greatly stimulated when the county has established railroad connection with the outside world. At present summer visitors use all the fruit raised. Lake County reports 1,729 acres in fruit—1,022 bearing and 707 not bearing. Wine making is an important industry at Lower Lake, Middletown, and on the northwest shore of Clear Lake. The wine vintage is of excellent quality, and Lake County wines are in great demand. A reliable correspondent reports a very large acreage planted to prunes the past two years. Lake County apples took a premium at the World's Fair in New Orleans.

Stock Raising.—The entire county is an excellent stock and dairy district, though not so extensively developed as it might profitably be. The raising of blooded stock is a prominent industry in this county. The Assessor reports 3,228 horses, 6,629 cattle, 1,434 hogs, 237 mules, 9,851 sheep, and 1,149 goats.

Timber.—The timber product is considerable, most of that cut being sugar pine, besides yellow pine, fir, cedar, and oak. There are 11 saw mills in the county. Many acres of fine timber are untouched and subject to entry under Government laws. The timber supply is almost inexhaustible.

Minerals.—The leading mining industry of Lake is in quicksilver. At Middletown the population has increased one third the past year, principally owing to the immense developments in that vicinity. The Mirabel and Great Western Mines each turn out from 300 to 500 flasks of quicksilver monthly. A new mine is now being opened 4 miles from Lower Lake, with flattering prospects. Coal discoveries have been made near Lakeport. Gold and silver are found; also copper, mica, limestone, asbestos, soda, borax, sulphur, etc. A railroad would contribute renewed activity to all these developments.

Artesian Wells.—Clear, flowing water, in almost any part of the county, is reached at a depth varying from 60 to 100 feet, and in some places there are wells throwing a 6-inch stream 12 feet above the surface.

Health and Pleasure Resorts.—There are at least fifteen health resorts in Lake County, mostly owing their existence to renowned mineral springs, such as iron, sulphur, soda, magnesia, arsenic, in many instances in close proximity; among them are Bartlett's, Allen's, Zeigler's, Harbin's, and a number of others. These springs are reached either by way of Cloverdale or Ukiah and stage from the south, or by stage from Sites, in Colusa County, from the east. There are most excellent hotel accommodations at all these places of resort, where you may get hotel fare or hire a cottage, or camp out, as many do. Clear Lake is a beautiful sheet of water, fed by several streams; both lake and streams are alive with trout, salmon, perch, carp, and many other varieties of fish.

Prices of Land.—Prices of land vary according to location. First-class improved, near towns, from \$100 to \$200 an acre; land as good, unimproved, from \$30 to \$100. Much Government land can yet be had by searching for it. In general, the man of moderate means has excellent opportunities for securing a home in this county.

LASSEN.

Lassen County is bounded on the north by Modoc, west by Shasta, south by Plumas County, and east by the State of Nevada.

Statistics.—Area, 4,750 square miles, or 3,040,000 acres. Unentered and unsurveyed Government land, about 2,500,000 acres. Lands assessed, 381,744 acres. Total assessed value of all property, \$2,852,156. Rate of taxation, State and county, 1.80. Number of miles of railroad, 47.60; assessed at \$88,910. County property, \$15,000. County debt, none. Number of schools, 36. School children between 5 and 17 years, 1,033. School money, \$22,141 49. Population, census of 1890, 4,144.

County Seat and Principal Towns.—The county seat is Susanville, located on the Susan River, just beneath the pine-covered summit of the Sierra Nevada, and on its eastern slope, at an elevation above the sea of 4,200 feet. It has ample water power. The place is a mass of shade, from its abundant orchards of apple, pear, peach, plum, prune, and cherry trees. It is a substantial, well-built, thriving town, with good public and business buildings, churches, schools, and two newspapers. The United States Land Office of the district is here located. The principal towns are Amedee, present terminus of the Nevada and California Railroad from Reno; Bieber, on Pitt River; Janesville, Bunting-

ville, and Millford, all with stores and mills, and surrounded with orchards and grain and hay ranches.

Topography.—This county lies on the east of the Sierra Nevada Mountains, and is a succession of mountain ranges and valleys. About 375,000 acres are valley, 325,000 acres are foothill, and the remainder mountainous. In its eastern part the hills are regardless of order of arrangement; in the central and western parts, their trend is mainly to the southeast and northwest. In the west, Lassen Buttes rise over 10,000 feet above the sea-level. Diamond Mountains divide Lassen from Plumas County. Big Valley, in the extreme north, watered and drained by Pitt River, which runs west into the Sacramento, extends west into Modoc County, and has in Lassen County about 75,000 acres. Honey Lake Valley borders Diamond Mountains, and is 45 miles from southeast to northwest, and about 15 miles wide. Long Valley, in the extreme southeast, unlike the other valleys, is of small value for agricultural purposes. In the east-central portion lie the Madeline Plains, a large, level tract, 35 by 15 miles, 5,300 feet altitude, and covered with sagebrush. Eagle Lake is a beautiful sheet of water, with an area of 27,813 acres. Honey Lake lies too low to be used for irrigation.

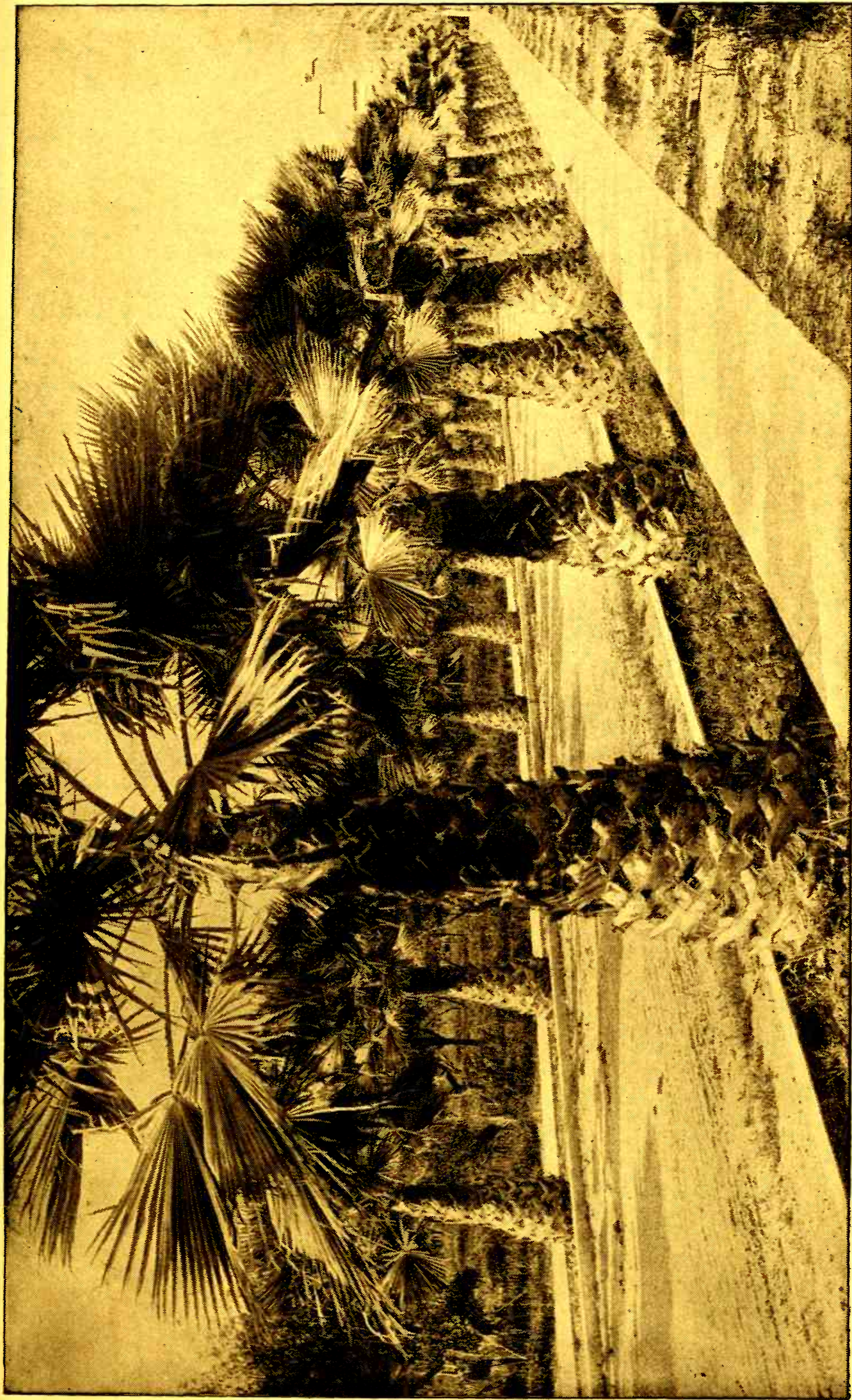
Soils.—The soil along the streams is either a dark or sandy loam; on the plateaus, lighter loam; on the foothills and mountains, decomposed lava, which element enters also into the composition of the lower soils. Honey Lake Valley is largely sedimentary, from waters formerly covering its entire area, rich in all of the elements needed for vegetation, whether humus or mineral, and bears continuous cropping without material deterioration. The soil is several feet deep, with heavier and stronger stratum underlying, which carries more clay. There is no hardpan or hog-wallows. East of Honey Lake it much resembles the fertile white ash land of Fresno County. Big Valley has a large body of level agricultural land, of black sedimentary loam, suited to heavy crops of grain, alfalfa, or fruits.

Climate.—The air is bracing and tonic at such high elevation, and the climate exceedingly healthful. In winter there are heavy snowfalls, and the climate approximates in character that of Salt Lake, though more agreeable, being cooler in summer and warmer in winter. No winter crops can be grown, and in summer little if any rain falls, rendering irrigation necessary. Susanville meteorological reports give for 1891: Average winter temperature, lowest, 22°; highest, 62°; average summer temperature, lowest, 45°; highest, 91°; extreme lowest winter, January, 4°; extreme highest summer, July and August, 93°. The average annual rainfall is about 23 inches, and of snow, about 90 inches, the latter from November to March, the heaviest in December and January.

Irrigation.—Extensive systems of irrigation are in use and being built, using the available waters of Susan River and Eagle Lake, and a large amount of arid land is being gradually reclaimed and brought into great productiveness. There are a number of irrigation systems, with their various reservoirs and canals, having an assessed valuation last year of \$10,500, and these are being actively enlarged, extended, and increased in number. By these facilities for irrigation vast bodies of fertile lands will soon be brought under cultivation. The principal irrigation systems are located in Honey Lake Valley, Susan River, Willow Creek, Long Valley Creek, Secret Valley, Madeline and Horse Lake Valleys, and Willow, Grasshopper, Pitt, Fish, and many other valleys. There are twenty-two permanent lakes in the county, with an aggregate area of 94,000 acres. Much land is being entered under the Desert Land Act.

Agriculture.—Wheat, barley, rye, and oats yield heavy and certain crops. Wheat averages 30 to 40 bushels to the acre; barley, 50 bushels, and oats, 40 bushels. Alfalfa is largely grown, and yields, under irrigation, three or four crops a year, of 6 to 8 tons per acre in the aggregate. One case is reported of a yield of 6 tons the first seeding, on sagebrush land on Willow Creek. Red top clover, timothy, and other natural grasses grow abundantly, and yield naturally, without irrigation, 1 to 2 tons an acre. Potatoes yield from 200 to 400 bushels to the acre, and of finest quality. Corn is grown in some places.

Horticulture.—Lassen is making rapid progress in fruit culture. Its soils are well fitted for apples especially, and apricots, pears, peaches, and plums grow well. The apple acreage is distributed as follows: Millford, 150 acres; Janesville, 35 acres; Susanville, 70 acres; Long Valley, 20 acres; Big Valley, 12 acres, and scattering, 50 acres. One sample



PALM GROVE, LOS ANGELES CITY,

of yield from 400 trees is, crop sold for \$1,500, cider and vinegar, \$400. The total area in fruit in 1892, 582 acres—414 acres bearing and 171 not bearing. The apples of Lassen County are unsurpassed anywhere, being of fine quality and large size, and their cultivation is destined to become a most important industry under the stimulus of irrigation and settlement.

Stock Raising and Dairying.—Stock raising and dairying are the leading pursuits at present. Stock must be well protected in winter to give good results. The butter product of Lassen is of the finest quality. The stock ranges are excellent. Bunch grass furnishes abundant feed, though much better results are obtained from the cultivated grasses, grains, and alfalfa fields. As is the case with some other counties of California, better facilities of railroad communication will greatly stimulate these industries.

Timber.—The county contains about 500,000 acres of valuable timber, and 300,000 acres of light timber. Eight saw mills supply the local demand. With railroads an immense quantity of lumber could be furnished, of sugar and yellow pine, fir, and cedar.

Mining.—This is not properly a mining county, though there are a few paying mines, both quartz and placer, especially south of Susanville and northward at Hayden Hill. Some rich gold finds were reported during July, 1892.

Prices of Land.—Unimproved lands without water can be located under the Desert Land Act, and improved with water varies from \$25 to \$50, and in some cases to \$100, according to quality and location.

LOS ANGELES.

Los Angeles County is bounded north by Kern, east by San Bernardino, south by Orange County and the Pacific Ocean, and west by Ventura County.

Statistics.—Area, 4,142 square miles, or 2,650,880 acres. Unentered Government land, 466,569 acres. Lands assessed, 1,041,898 acres. Total assessed valuation of all property, \$82,839,924. Rate of taxation, State and county, 1.45. Number of miles of railroad, 279.58; assessed at \$2,334,773. County property, \$1,030,000. County debt, \$1,011,500. Number of schools, 439. School children between 5 and 17 years, 25,576. School money, \$370,513 49. Population, census of 1890, 101,410.

County Seat and Principal Towns.—Los Angeles, the county seat, has a population, census of 1890, of 51,100, and is the second city in population in the State. It is the commercial metropolis of the southern counties, and is pleasantly located, about 15 miles from the ocean, and an equal distance from the mountains. Within the city limits are hills that afford picturesque residence sites. The city has grown from a sleepy, semi-Mexican pueblo of 11,000 people, in 1880, to a handsome modern city of over 50,000 in 1890. The present population is estimated at 65,000. The assessed valuation of the city has quadrupled in ten years. There are 100 miles of graded and graveled streets, 11 miles of paved streets, 100 miles of cement sidewalks, sewer, water, and electric light systems, and 100 miles of street railway track, electric and cable. During the past seven years, buildings to the value of \$20,000,000 have been erected, including a \$500,000 Court-house and a \$200,000 City Hall. Numerous large blocks and residences are now being built. Eleven railroads center in Los Angeles. The commercial future of the city is assured, it being on a direct line of the shortest route and easiest grades between the two oceans. Business is good. Vacant houses are scarce. The nineteen banks contain \$11,000,000 on deposit. The bank clearings have been steadily and largely increasing during the past six months. Real estate is on the upgrade, and Eastern capitalists are making large investments. Manufacturing industries employ several thousand people. There are good hotels, theaters, schools, colleges, churches, and libraries. The Chamber of Commerce, a live organization, does much to further the interests of this section. The floral wealth of the Los Angeles gardens excites the admiration of visitors.

Pasadena, "the crown of the valley," a beautiful residence town, twenty minutes ride, by two lines of railroad, from Los Angeles, has grown within twenty years from a sheep pasture to a world-renowned city of beautiful homes, with a population of some 7,000. It has paved streets, fine business blocks, churches, schools, library, and banks.

Monrovia and Duarte are in the heart of the San Gabriel Valley citrus belt.

Azusa is a flourishing horticultural settlement in the San Gabriel Valley, where oranges and strawberries are largely grown.

Pomona, 30 miles east of Los Angeles, is a thriving little city, which has grown from a population of 130 in 1880, to about 5,000 to-day. It is the leading, "all around" fruit center of the county, oranges and deciduous fruits being grown in about equal proportion. It is also headquarters of the olive industry in the county.

Downey, Norwalk, and Compton are quiet, prosperous places, in the Los Nietos Valley, surrounded by fertile fields, upon which large crops of alfalfa and fruit are raised.

Whittier, created five years ago as a Quaker colony, has grown into a handsome little city. It has a slightly location, on a sidehill. The lemon thrives here. There is a cannery, fruit drier, and large nurseries. The State Reform School, with 400 inmates, is here.

Santa Monica, 15 miles from Los Angeles, on the ocean, has about 2,000 population, well-graded streets, tasteful residences in beautiful grounds, a fine beach, a number of business blocks, and a large hotel. Four miles north is the big wharf, and 3 miles east the National Soldiers' Home with about 1,000 inmates.

Redondo is a new port and resort, created during the past five years. A large shipping business is done at the wharf. There is a pebble beach, good fishing, large hotel, bath houses, etc.

San Pedro is chiefly known as a harbor, but deserves to be more frequented as a resort. There is good fishing and boating in the harbor.

Long Beach is a quiet family resort, with one of the finest beaches on the coast. A wharf is being built.

Between Los Angeles and the ocean are Inglewood and The Palms, both attractive residence places. Burbank and San Fernando are north of Los Angeles, in the San Fernando Valley. Glendale is a pleasant northern suburb of Los Angeles.

Topography.—About four fifths of the area of Los Angeles County is capable of cultivation, with water supplied, the remainder being mountainous. The shore line is 85 miles in length, the county extending from 30 to 50 miles back from the ocean. The northern portion of the county is a part of what is now called the Mojave Desert, the western section of which, known as the Antelope Valley, is being rapidly settled and cultivated. South of this, extending almost to Los Angeles City, is the great San Fernando Valley. East of Los Angeles is the beautiful San Gabriel Valley, shut in from the north by pine-clad mountains. This, in turn, opens into the Pomona Valley. Both are celebrated for their horticultural products and beautiful homes. Westward from the county seat, toward the ocean, extends the Santa Monica range of low mountains. South of this range, between the city and the ocean, is a wide and fertile plain, with several small settlements. Southeast of Los Angeles is the Los Nietos Valley, a fertile section, with plenty of moisture, where there are many dairies, corn and alfalfa fields, as well as orchards. More than 90 per cent of the development, thus far, has been in the southern portion of the county, most of the steep mountains and waste land lying in the northern section.

Soils.—In the lower valleys, the soil consists of a rich alluvium, deposited by streams in past ages. The upper valleys possess all grades of this alluvium, and have, also, in some places, a black soil called adobe, which forms in winter a tenacious mud. It is well adapted to grain and some varieties of fruit. On the mesas, or plains, there is much soil composed of debris washed from the mountains, mixed with vegetable accumulations; also some sandy clay. A large area is rich, sandy loam, with water at from 5 to 12 feet below the surface. On the rolling and table lands the soil is warm, porous, and more or less sandy, well adapted to fruit culture. Next come the foothills, with much decomposed granite; this makes the choicest citrus fruit land. Beyond are the mountains, much of the land in which is good for pasturage, with small arable valleys. Where there are so many varieties—sometimes several within the limits of one farm—it is easy to find soil adapted to any product that can be raised in this section.

Climate.—A remarkable variety of climate may be found within the limits of the county, the difference being caused by elevation and distance from the ocean. On the coast it is cool in summer and a little warmer in winter. There are occasional fogs at night. This climate is well adapted to those who suffer from nervous affections. Farther inland it becomes warmer, and in places decidedly hot at times during mid-summer days, although there is always a gentle breeze from the ocean, and the summer nights are cool enough to make blankets welcome. As the mountains are climbed a cool, bracing, dry air is encountered, which is very beneficial to consumptives. On a

winter's day one may breakfast by the seashore, after a dip in the ocean, lunch amid the orange groves of the San Gabriel Valley, and dine on the snow-capped summits of the Sierra Madre, under the towering pines. The climate is an "all the year round" one, pleasant in summer as well as in winter. At Los Angeles the temperature seldom reaches 100°, and still more rarely sinks to the freezing point.

Water and Irrigation.—For citrus fruits, berries, vegetables, and alfalfa, irrigation is generally necessary. With irrigation, two and sometimes three crops of vegetables are frequently raised during the year. Los Angeles County is well supplied with water for irrigation. The Los Angeles and San Gabriel are the only two streams of importance, but there are several belts of land where abundant water for irrigation is obtained from flowing artesian wells, notably in Pomona, Antelope, and San Fernando Valleys, and in the section southeast of Los Angeles City, which appears to be underlaid by a great river. There are many irrigation systems. Much water now goes to waste which will, in time, be stored in mountain cañons and utilized for irrigation.

Agriculture.—The grain area of the county is being gradually extended as new land in the great Antelope Valley comes under the plow. Most of the grain, which is of fine quality, is raised north of Los Angeles, in the San Fernando and Antelope Valleys. On some large ranches, wheat has averaged a yield of a ton to the acre. About 1,300 pounds is considered a good average. South and east of the city much corn is raised, of a quality that cannot be surpassed. The stalks sometimes attain a height of 20 feet, and the yield is frequently 100 bushels to the acre. It is generally raised without irrigation. Alfalfa is a leading crop, and finds a ready market at good prices. Large quantities of grain are also cut, while green, for hay. Several sections of the county are eminently adapted to the raising of sugar beets, samples grown having given high tests.

Winter Vegetables.—There are several narrow belts where frost is practically unknown, notably in the Cahuenga Valley, between Los Angeles and the ocean. Here delicate vegetables, such as tomatoes, Chile peppers, string beans, and green peas, are raised and shipped in midwinter to San Francisco and Eastern points, realizing fancy prices. Carloads of potatoes, cabbage, celery, and cauliflower are also shipped in winter to Eastern points.

Horticulture.—There are about 1,500,000 fruit trees growing in the county, and planting is going forward with great rapidity. Los Angeles, though no longer the center of citrus culture in California, still ships more oranges than any other county, many of the trees being fifteen years old and upwards and bearing immense crops. Most of the orange orchards are in the San Gabriel and Pomona Valleys. The lemon is also profitably grown in suitable localities. The olive has been largely planted of late, doing well almost everywhere in the county. Fine oil is made. The chief deciduous fruits are apricots and prunes, which yield heavy crops and pay large profits. The walnut crop of last season amounted to nearly 100 carloads. Peaches, grapes, nectarines, figs, almonds, apples, pears, guavas, berries, and a number of other fruits are also grown. There are many fruit drying establishments and two of the largest wineries in the State, besides several smaller ones. Berries are very profitable. From one point in the San Gabriel Valley 500,000 pounds of strawberries were shipped last season. The total fruit acreage is 37,594—bearing, 20,472; not bearing, 17,122. Of this acreage there are 7,387 bearing and 4,910 non-bearing orange trees. The plant for 1892 was 8,724.

Live Stock.—Few cattle or sheep are raised on open ranges, the land having become too valuable. Hogs do well on alfalfa, being "finished off" on corn. The establishment of a large packing house in Los Angeles promises to give a great impetus to this industry. Los Angeles thoroughbred horses are noted throughout the country, there being two celebrated stables in the San Gabriel Valley, which have carried off many of the big prizes of the turf. Dairy products always command a high price. There is much butter and some cheese made, yet large quantities of both products are still imported. The same is true of eggs and poultry. The price of eggs seldom falls below 25 cents a dozen. Much honey of fine quality is made in the mountain regions. The labor incidental to bee-keeping is light, and the profits generally large in proportion to the small amount invested. Some ostriches are raised for their feathers. The fishing industry on the coast is capable of much greater development.

Minerals.—Notwithstanding the fact that gold was discovered and washed out in this county many years before the discovery by Marshall at Coloma, little has been

done to prospect or develop the mineral resources of the county. There are several promising gold ledges near Acton, in the northern part of the county, which are being worked on a limited scale. Some rich silver ore has been mined in the San Gabriel Valley. Good building stone is quarried at several points. Near Redondo are salt works. Veins of copper, iron, and coal have been found. The oil wells at Puente supply most of the petroleum used for fuel in Los Angeles. Large oil deposits are also worked near Newhall. Several flows of natural gas have been obtained around Los Angeles, offering encouragement to further search.

Manufactures.—The manufacturing industry is yet in an embryo stage, although by no means unimportant. Among the chief articles made are canned, dried, and crystallized fruits, iron castings, iron and cement pipe, machinery, brick, boxes, flour, crackers, soap, doors and sash, pottery, mineral water, beers, wine and brandy, furniture, candy, pickles, and ice. A smelter and a hog-packing factory are going up in Los Angeles, and a small rolling mill, to utilize scrap iron, is about to be established. There are good openings for more fruit-preserving works and creameries; also for glass factories, tanneries, harness, saddle, and shoe factories, paper mills, rope works, nail and wool factories.

Harbors.—The shipping ports of Los Angeles are San Pedro and Redondo, to which will shortly be added Santa Monica—where the Southern Pacific Company is building a wharf 4,600 feet long—and Long Beach. Government engineers have recommended an appropriation of nearly \$3,000,000 for the creation of a first-class deep-water harbor at San Pedro, where vessels of the deepest draught may come to the wharves.

Transportation.—The transportation facilities of the county are unexcelled. Besides the Southern Pacific and the Santa Fe, which are transcontinental lines, and their numerous branches, there is the Terminal, which is projected as the Pacific Coast end of a third transcontinental route, and the Redondo Railway. No point in the southern portion of the county is more than 5 miles from a railroad. Vessels of the Pacific Coast Steamship Company call regularly for freight and passengers at San Pedro and Redondo. The Atlantic and Pacific Steamship Company's freight steamers also call at the latter place.

Resorts.—The tourist and health seeker and lover of nature may find a great variety of resorts in Los Angeles County, both seaside and mountain. Santa Monica, Redondo, and Long Beach afford fine bathing facilities all the year round. Santa Catalina, a large and romantic island, 20 miles from shore, is much frequented in summer. In the mountains are cool cañons and shady nooks among the pines. A railroad is being built up the Sierra Madre, back of Pasadena. There are mineral springs at several points. Good hotels abound, and charges are reasonable.

MARIN.

Marin County is decidedly a county of water frontage, being bounded on the north by Sonoma County, west and south by the Pacific Ocean and the Golden Gate, which separates it from San Francisco by only a mile and a half at its nearest point, and east by San Francisco Bay.

Statistics.—Area, 509 square miles, or 325,000 acres. Lands assessed, 326,910 acres. Total assessed value of all property, \$12,452,622. Rate of taxation, State and county, 1.25. Number of miles of railroad, 81.25; assessed at \$640,116. County property, \$115,000. County debt, \$273,100. Number of schools, 48. Number of school children between 5 and 17 years, 2,434. School money, \$54,381 41. Population by census of 1890, 12,613.

County Seat and Principal Towns.—San Rafael, the county seat, has a population of 3,891. It has many fine buildings, public and private, elegant hotels, banks, two newspapers, five churches, schools, electric lights, and a perfect sewerage system, etc. It is a noted place of residence for San Francisco business men, and its hotels are a favorite resort for invalids and tourists. Its climate is regarded as very favorable for those with pulmonary complaints. Its private dwellings are elegant and its drives most beautiful and romantic. The road to the summit of Mount Tamalpais, at an elevation of 2,608 feet, is a continuous and easy grade. San Rafael, in its sheltered valley, is secure from ocean fogs and winds. It is in constant communication with San Francisco by rail and ferry at Point Tiburon.

Sausalito is also a favorite place of residence for San Francisco business men, possessing features similar to San Rafael. Novato is the center of the fruit district of the county; Point Reyes of the dairy interests.

Other places of note are Mill Valley, with its large virgin grove of redwoods; Camp Taylor, a noted resort for campers; Tomales, Belvidere, and Larkspur. Bolinas is a delightful watering place, on Bolinas Bay, reached by stage from San Rafael, or from nearer points on the North Pacific Coast Railroad. With railroad connection and proper advertisement, it would become noted, as its beach and surf bathing are equal to Santa Cruz, and its climate delightful and invigorating.

At San Quentin is located the largest of the two California State Prisons. It is situated on San Francisco Bay, about 12 miles north of San Francisco, with which it is connected by ferry.

Topography.—The county is traversed by a range of hills, a spur of the Coast Range, from northeast to southwest, the highest part of which is Mount Tamalpais, 2,608 feet. Its surface is broken and irregular, and numerous small valleys intervene. The ocean coast is abrupt and rugged, and indented by bays, such as Bolinas, Drakes, Bodega, Tomales, Limantour, and Richardsons, from which much shipping is done by coasting vessels. The shores along the bay have in many places much marsh land of great fertility. A heavy body of timber extends from the head of Tomales Bay along the eastern slope of Olema Valley, and between Olema and San Rafael is a magnificent body of virgin redwood timber. Over the entire area are scattering oaks and other timber, furnishing abundant fuel.

Soils.—The soil of Marin County varies from the rich adobe of the salt marshes to the sharp, gravelly loam of the higher foothills. In the small valleys is a heavy black loam, with gravelly admixture. In the foothills is a reddish loam. All of these are easily worked and heavily charged with plant food, as the results of cultivation show.

Climate.—West of the hills and on the ocean frontage the climate is foggy, moist, and windy, with much disagreeable weather. On the east of the Coast Range and skirting San Francisco Bay an entirely different climate prevails, sheltered from winds, mild, genial, and sunshiny. In a word, this inland climate is unsurpassed in the State, having very little variation of temperature, dry air, no winds during nine months of the year, and but little during the other three—March, April, and May. Average annual rainfall at Point Reyes, 17.56; Point Bonito, 25.39; San Rafael, 39.58. In July and August, no rain; in June, .47 of an inch; in September, .39 of an inch. Most of the rain falls from November to April. Mean summer temperature of San Rafael, 76° for June, July, August, and September; for the other eight months, 61°.

Agriculture, Dairying, and Stock Raising.—Very little attention is paid to agriculture, with the exception that an immense amount of vegetables is shipped from the lowlands of the county. The county is mainly devoted to dairying. Its shipments of butter are enormous, being from 600,000 to 800,000 pounds annually, and the quality of the product is too well known to require comment. Most of the large ranches are stocked by the owners, and divided into tracts, which are leased by them at annual rentals, according to the number of cows, the usual charge being \$25 to \$30 a head per annum. This system has prevented the subdivision of the land and retarded population. The Assessor's report shows 2,553 horses, 33,519 cattle (of which 26,104 are cows), 7,127 hogs, 245 sheep, and 2,570 dozen poultry.

Horticulture.—The principal fruit district is around Novato. The chief product of this section is apples. There are reported 777 acres in fruit, of which 636 are bearing and 141 not bearing; of this total 486 acres are in apples. The apples raised here are of first quality, the bulk of them, selected, being shipped to Australia, where their reputation is established, and they bring a high price. The Novato Ranch orchard, of 250 acres, contains 22,000 apple trees, 2,000 apricots, 3,500 pears, and the balance mixed fruits. This orchard, first planted in 1857, has been in steady and profitable bearing ever since. The canning fruits of this section are shipped to the Petaluma cannery; the culled apples made into cider and vinegar. Apricots in this section ripen very late. These results show what could be done in this county were the lands suited to fruit culture subdivided and more attention given to the industry.

Timber.—Much timber has been cut from the sections described above under the head of "Topography," but a large area is yet untouched by the woodman's ax.

Transportation.—Two lines of railroad traverse this county—the North Pacific Coast, with terminus at Sausalito and the San Francisco and North Pacific, with a terminus at Point Tiburon.

MARIPOSA.

Mariposa County is bounded on the north by Tuolumne County, east by Mono, south by Fresno, and west by Merced and Stanislaus.

Statistics.—Area, 1,543 square miles, or 988,000 acres. Unentered Government land, 500,000 acres, principally mountainous. Lands assessed, 335,453 acres. Total assessed value of all property, \$1,897,705. Rate of taxation, State and county, 2.40. County property, \$37,000. County debt, none. Number of schools, 38. Number of school children between 5 and 17 years, 991. School money, \$16,711 82. Population, census of 1890, 3,817.

County Seat and Principal Towns.—Mariposa, the county seat, is well built and provided with churches, schools, hotels, substantial county buildings and business houses, and the only newspaper in the county. Hornitos and Coulterville are mining towns. The absence of railroads retards development in the county, and these towns are not growing.

Topography.—Mariposa begins on the west in treeless plains, has an altitude of 300 feet above sea-level, and passes up to the Sierra Nevada on the east, with an altitude of 13,000 feet. The highest peak is Mount Dana, 13,227 feet. The general topography resembles that of Amador, Calaveras, and El Dorado Counties. There are about 300,000 acres of plains and lower foothills together, the latter predominating, and the balance consists of high hills and mountains; bare of timber on the plains, then scattering oak and scrub pines, then rising to immense tracts of sugar and yellow pine, fir, spruce, and cedar, and the giant sequoias of Mariposa Big Tree Grove, which contains some 427 trees, some of 35 feet diameter, and 150 to 300 feet high. The county is well provided with natural water in the Merced, Mariposa, and Chow Chilla Rivers, fed from perpetual snows. The famous Yosemite Valley is located in the eastern part of this county, at an elevation of 4,060 feet, with walls 5,000 feet higher. The Merced River flows through the valley. This famous valley has been too often and too graphically described to need detailed notice here.

Soils.—The soil of the plains and valleys is black alluvium, and in the lower foothills sharp, red admixture of adobe and gravel, all easily cultivated and good for grain and fruits.

Climate.—The climate does not differ from that of Amador and Calaveras. Hot in the summer in the plains and lower foothills, and bracing and invigorating in the mountains. In winter it is delightful in the lower altitudes, while uninterrupted arctic weather prevails in the high mountains, with abundant and lasting snows.

Irrigation.—Irrigation is practiced to some extent, water being taken from streams and mining ditches by private parties, and used with good results. There are 116 miles of irrigating and mining ditches, assessed at \$6,420.

Agriculture and Stock Raising.—The county, outside of mining, is mostly devoted to grazing and stock raising, not much grain being raised. The cattle and sheep are ranged in the mountains in the short summer and in the valleys and plains during the winter. The Assessor's report for 1892 shows 1,902 horses, 390 mules, 32,110 sheep and lambs, 7,164 cattle, and 2,060 hogs.

Horticulture.—The capacities for fruit culture are precisely similar in range and quality to Amador and El Dorado Counties, remoteness from the market retarding development. All fruits grow finely; the orange, lemon, fig, olive, apricot, almond and walnut, peach, pear, plum, prune, and cherry in the lower foothills and protected valleys, the grape abundantly through the wider range, and the apple, of very fine quality, in the higher altitudes. At Coulterville there is one orchard of 140 acres recently planted, not yet bearing, but doing finely. Coulterville, Jerseydale, Darrah, and Grant Springs are the principal fruit districts. They are capable of vast extension. In 1891 the output reported was: apples, 2,000 boxes; pears, 500 boxes; other fruits not reported. The total acreage in fruit is 564, of which 415 are bearing and 149 not bearing, and in the following order of fruits: grapes, apples, pears, oranges, apricots, olives, figs, almonds, peaches, prunes, cherries, walnuts. All that this interest needs for its full development is what the other interests of this county need, railroads.

Timber.—The timber resources of this county are practically inexhaustible, only needing transportation for development. There are twelve saw mills working on local demands.

Mining.—In former days Mariposa has yielded immensely in gold from its rich plains. The county is seamed with quartz veins and only needs cheap freights to stimulate further developments. The Mother Lode runs through this county. The quality of the ores is mainly like that of Amador County. Some of the principal mines are as follows: Bear Valley, Daisy, Sebastopol, Farmer's Hope, Hayseed, Peregoy and Heiser, and the mines of the Mariposa estate, the Princeton, Josephine, and Pine Tree. The Princeton has yielded over \$3,000,000. Much prospecting is being done about Mariposa, which, at least, results in wage making. In the northwest part of the county, the Red Cloud and Sutherland are worked steadily and profitably. The general run of ores yield from \$10 to \$15 per ton, though numerous pockets are struck here and there running up into the hundreds per ton. There are several fine veins of good marble in the county. Silver and copper are also found.

Health and Tourist Resorts.—It is needless to mention the Yosemite Valley, world renowned, and the Mariposa Big Trees. The mountain streams abound in trout, the forests in game, and the resinous air of the pine-clad hills gives renewed health and delight in living.

Prices of Land.—The county is taking a new start this year. Agricultural or fruit lands range from \$7 to \$35 an acre.

MENDOCINO.

Mendocino County is bounded on the north by Humboldt and Trinity, east by Tehama, Glenn, and Lake, south by Sonoma County, and west by the Pacific Ocean.

Statistics.—Area, 3,816 square miles, or 2,442,000 acres. Unentered Government land, 1,000,000 acres. Lands assessed, 1,302,066 acres. Total assessed valuation of all property, \$12,208,057. Rate of taxation, State and county, 1.50. Number of miles of railroad, 30.80; assessed at \$327,126. County property, \$82,700. County debt, \$112,000. Number of schools, 93. School children between 5 and 17 years, 4,505. School money, \$92,949 20. Population, by census of 1890, 17,573.

County Seat and Principal Towns.—Ukiah, the county seat, population about 2,000, is located in Ukiah Valley, 113 miles from San Francisco by rail, and 700 feet above sea-level. It is incorporated, has two banks, fine hotels, six churches, schools, and elegant private residences. It is the principal business town of the county. The Branch State Insane Asylum, near here, is about completed. Other interior towns are Hopland, Laytonville in Long Valley, Cahto, Willits, etc. On the coast is Mendocino City, population 900, with two banks, two newspapers, churches, schools, hotels, and public buildings; Fort Bragg, population 1,100, with bank and building and loan association; Greenwood, population 700; Point Arena, population 800, famous for butter and cheese shipments; Westport, population 600; Gualala, Manchester, Navarro, Whitesboro, Albion, Little River, Caspar, Soyo, Cleone, Rockport, and Usal, each from 100 to 300 population. Cuffey's Cove is noted for potato shipments.

Topography.—Mendocino County is traversed by two branches of the Coast Range through nearly the central portion, from north to south, from 1,000 to 3,000 feet altitude. The Eel River runs northerly and the Russian River southerly through the central portion, with a large number of tributaries, the dividing ridge being a little north of Ukiah. The western range is 15 miles from the ocean. This district is intersected by numerous streams. In the eastern and northern portions of the county are many productive small valleys, such as Sanel, Anderson, Yorkville, Redwood, Ukiah, Potter, Little Lake, and Round Valleys.

Soils.—The soils of these valleys are variable, comprising sandy loams, rich black loams, clay loams, light yellow clays mixed with coarse gravel, and some large bodies of black gravel, but all of them very fertile and productive for cereals, grasses, and fruits.

Climate.—The climate varies with altitude and proximity to the ocean. On the immediate coast heavy fogs and strong winds are common. During the summer 100° is sometimes reached; the mean is about 80° in summer and 40° in winter. In the interior valleys the climate is warmer and less foggy, but owing to air currents and elevations

very diversified. Sanel, Ukiah, Redwood, and Potter Valleys have a similar climate. In the absence of figures the climate may be ascertained from the fact that it is favorable to the growth of prunes, pears, and cherries. The average annual rainfall at Ukiah is 33.63 inches.

Agriculture.—Hops, potatoes, grain, hay, and alfalfa are the principal agricultural products. There are about 1,000 acres in hops, distributed as follows: Ukiah, 562; Sanel, 216; Redwood, 58; Round, 47; Potter, 36; Yorkville, 26. The product is first class. This county is second to Sacramento in hop production. Grain hay is very profitable, and alfalfa is grown successfully, yielding three crops a season without irrigation. Wheat yields 20 to 30 bushels to the acre; barley and oats, 30 to 35 bushels; potatoes, 3 to 8 tons. Potter and Russian River Valleys give 40 to 50 bushels of corn to the acre. Cuffey's Cove, on the coast, is a great shipping point for potatoes. Ukiah Valley, in 1891, shipped 18,495 bushels of wheat, 16,723 bushels of barley, and 4,090 bushels of oats. Italian vegetable gardens supply Ukiah and vicinity.

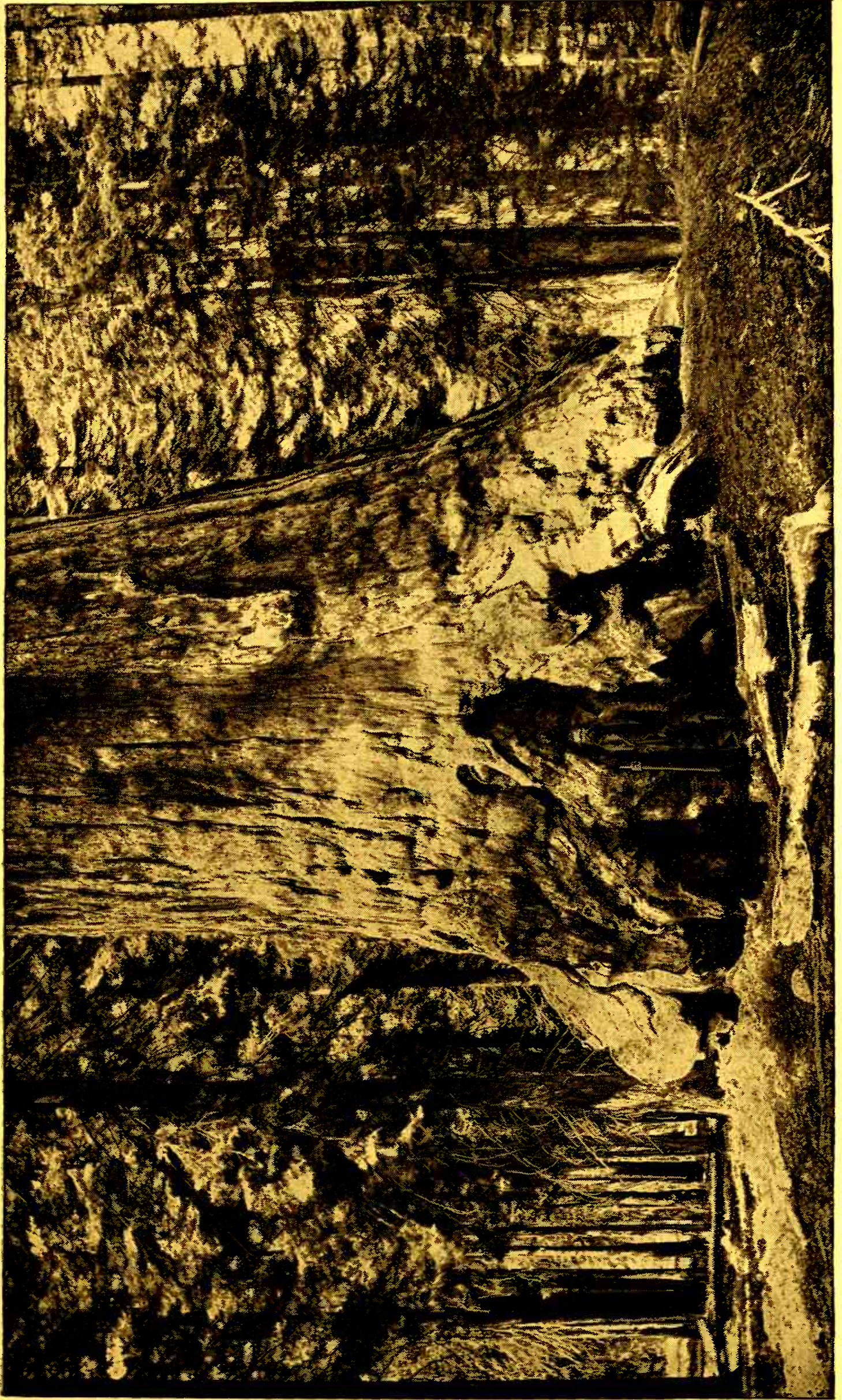
Horticulture.—The principal fruit sections of Mendocino are Sanel, Ukiah, Potter, Redwood, Little Lake, and Anderson Valleys. Carl Purdy, in "Republican Press," gives the acreage in prunes at 340, and in Bartlett pears, 125, in these valleys. It is conceded that the prune does exceptionally well. Small fruits do excellently. Apricots do not thrive in Mendocino County. Apples are the leading fruit. Grapes do well. There is a very small acreage in table grapes. There are some wine vineyards, and considerable quantities of wine and brandy are manufactured. The entire Russian River Valley and much of the Eel River Valley is good fruit land. The fruit exports of 1891 were 1,024 tons, one third being apples. Most of the apples are shipped to the coast, and from thence to San Francisco by water; some to Ukiah, and thence by rail. Total fruit acreage, 1,509—bearing, 869; not bearing, 640.

Stock Raising and Dairying.—Ukiah Valley shipped 4,000 bales of wool in 1891, valued at \$150,000. The entire wool crop amounted to \$400,000. Mendocino and Humboldt wool is the best in the State. A great deal of fine butter and cheese is made in several districts, and much of very fancy brand is shipped from Point Arena and Manchester, on the coast, to San Francisco, where it has an excellent reputation. The Assessor's report for 1892 gives 7,153 horses, 459 mules, 22,081 cattle, 10,522 hogs, and 120,599 sheep.

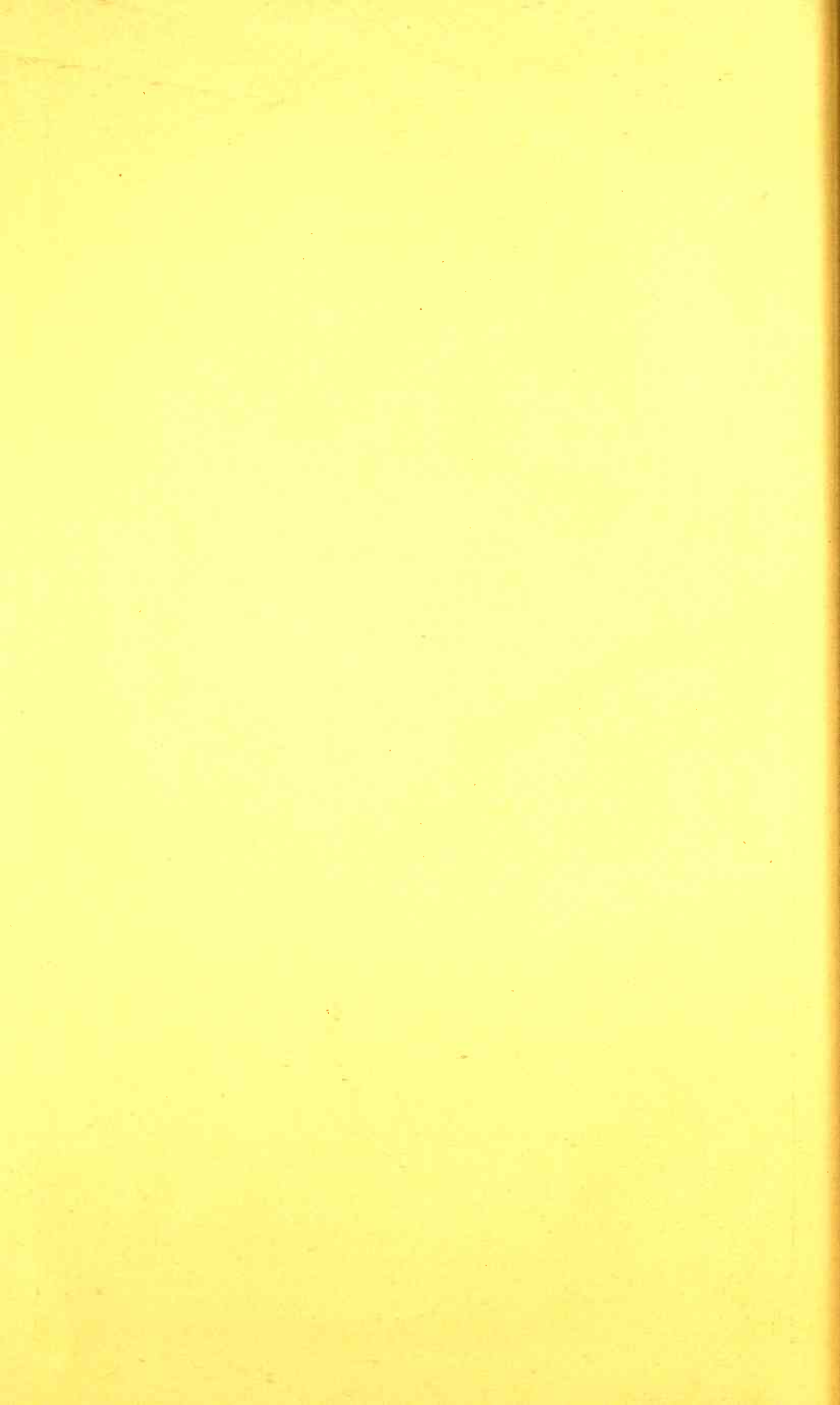
Timber.—Mendocino County shares with Sonoma, Humboldt, and Del Norte in possessing the largest body of redwood timber in the world. Mendocino claims about 900,000 acres. The standing timber is estimated at 12,000,000,000 feet; not over 5 per cent has been cut. This timber belt extends through the county from north to south, and averages 15 to 30 miles in width. The timber is of gigantic size. Besides redwood there are also large bodies of pine and spruce. There abounds, also, tan-oak, mountain laurel, and madrona. There are over 24 saw mills in the county, mostly in the coast region—at Gualala, Garcia, Point Arena, Greenwood, Navarro, Albion, Big River, Caspar, Noyo, Fort Bragg, Westport, Coltanova, and Usal. The lumber is loaded by chutes onto steam and sail vessels, and shipped to San Francisco and other ports. The coast shipments for 1891 were: lumber, 67,063,211 feet; ties, 603,336; posts, 123,966; shakes, 5,133,475. The shipments for 1892 are estimated at \$3,000,000; the amount cut at 120,000,000 feet. Besides these coast shipments, there are operating saw mills in the interior, on the Eel and Russian Rivers, and in other localities. Ukiah shipped \$50,000 worth of tan bark in 1891.

Mining.—Throughout the county are found limestone, quicksilver, coal, copper, some gold and silver, and asbestos. There are also indications of oil. The coal deposits are the most important and extensive as yet indicated. These indications run from northwest to southeast, across the Sanhedrim Range and the Middle Fork of Eel River, thence north and west of Round Valley, and they can be traced nearly 100 miles. The deposits are from 8 to 20 feet thick, and are being exploited. The quality is lignite, but better than any yet found in the State. Very little has been done in other mining, though there are many well-defined quartz ledges, containing gold and silver in small quantities.

Health and Pleasure Resorts.—There are numerous mineral springs, among which may be selected as best known the Duncan Springs, near Sanel Valley; Orr's Hot Springs, over the divide between Russian and Big Rivers, 14 miles from Ukiah, with hot sulphur waters; Vichy Springs, 3 miles from Ukiah, temperature 85°, much resorted to for baths. All of these are well equipped with excellent hotels, cottages, baths, etc.



"GRIZZLY GIANT," Sequoia, 33 feet in diameter; Mariposa Grove.



Indian Reservations.—Round Valley, about 60 miles to the northeast from Ukiah, contains about 18,000 acres of tillable land and the Indian reservation, which has recently been thrown open for settlement. This valley is isolated, but it is highly productive, and contains a population of 900 whites and 500 Indians.

Prices of Land.—Excellent lands can be bought here for \$25 to \$50 an acre. Grazing land throughout the county is worth from \$2 50 to \$5 an acre, and good agricultural and fruit lands in the different valleys above described will range from \$25 to \$50 an acre, according to the quality, nearness to the railroad, and other conditions.

MERCED.

Merced County is bounded on the north by Stanislaus, east by Mariposa, south by Fresno, and west by Santa Clara and San Benito Counties.

Statistics.—Area, 1,968 square miles, or 1,259,336 acres. Unentered Government land, 50,000 acres. Lands assessed, 1,083,736 acres. Total assessed value of all property, \$15,770,660. Rate of taxation, State and county, 1.35. Number of miles of railroad, 89.25; assessed at \$1,133,388. County property, \$84,000. County debt, \$128,900. Number of schools, 46. School children between 5 and 17 years, 1,819. School money, \$48,552 72. Population, census of 1890, 8,062.

County Seat and Principal Towns.—Merced City, the county seat, has over 2,000 population. It is located on the Southern Pacific east side line, and is also the junction terminus of the road from Stockton running through Oakdale and La Grange. It has five banks, three newspapers, five churches, good school buildings, elegant Court-house, substantial county buildings, and excellent hotels. It is the center of the grain shipping of the county, and has substantial and large warehouses. The city water is supplied in pipes from the reservoir belonging to the Crocker-Hoffman Canal. It is a healthy and handsome town.

Merced Falls has a woolen mill. Snelling, Atwater, and Turlock are grain and fruit producing and shipping centers. Los Baños is the leading town on the west side of the San Joaquin—on the new line of the Southern Pacific—where many lands are being subdivided for colony purposes and with promise of future development and prosperity.

Topography.—Merced County, in about the center of the San Joaquin Valley, extends from the foothills of the Sierra on the east to the summit of the Coast Range on the west. With the exception of the high foothills near its eastern boundary and the rugged steppes, abrupt cañons, small valleys, and sloping hills of the Coast Range, it is one vast plain, intersected only by watercourses. The Merced River is the chief stream, which rises in Mariposa, cuts through Yosemite Valley, and flows westward to join the San Joaquin River, which runs from south to north through the basin or trough of the valley. Many subordinate watercourses abound, which are usually dry in the summer.

Soils.—The soil varies with the locality. In the southern and western districts alluvial bottom land, rich for gardens, alfalfa, and grapes. Nearer the foothills is found a reddish adobe loam, rich in iron, somewhat mixed with gravel, and the favorite for citrus fruits both from situation and character; there is also found light chocolate loam intervening and near the hills, equally good for oranges and olives. Very light, sandy loam is found widely distributed over the plains, which requires much water to produce good results. There is very little waste land in the county.

Climate.—The climate closely resembles that of Fresno County. The coldest extreme of winter is never below 25°, and the hottest of midsummer not over 108°. There are nine months of mild, genial, healthful weather. The average annual rainfall for the past four years is 13.52 inches. The same extreme dryness of air prevails as in all the San Joaquin Valley.

Irrigation.—Extensive systems of irrigation are in use and extend through the county. The leading one, with 50 miles of canal and 150 miles of laterals and a large reservoir, is intended to cover 600,000 acres. Others cover, respectively, 50,000 acres and 30,000 acres. Water charges per acre, from these sources of supply, are reasonable, as in Fresno County. Artesian flowing water is struck in the southern and western sections of the county at 100 to 200 feet on the east side, and 200 to 400 feet on the west side of the San Joaquin.

Agriculture.—It is difficult to secure segregated figures of the grain production of the different counties of California, but it appears that in this valley San Joaquin County is first, Stanislaus second, Tulare third, and Merced fourth, in cereal products. The principal centers are Merced, Atwater, and Turlock, where there are large storage and shipping warehouses. Alfalfa grows five crops a year, with water, and cuts from 7 to 8 tons per acre in the aggregate. With irrigation these soils all produce abundantly of vegetables and fruits. All that this county needs is more settlement and energetic development.

Horticulture.—The principal fruit centers are Merced, Snelling, Merced Falls, Atwater, and Turlock. There are a number of important colonies here, especially of Hollanders, and they are all prosperous. They are principally engaged in vineyard and orchard planting. The soil and climate adaptation to deciduous and citrus fruits is as fine as any in the State. Oranges, though they grow well around Merced and in other parts of the plains, do especially well in the thermal belt of the foothills. Olives are being extensively planted and thrive wonderfully. Lemons grow to perfection; of which there is a successful grove of Villa Francas near Merced. The acreage in fruit trees and vines is 2,965, of which 1,956 are bearing and 1,009 not bearing. They range in importance as follows: grapes for table and raisin, peaches, olives, figs, prunes, plums, pears, almonds, oranges, apricots, and apples. Not much outside shipping is done as yet, but there are immense future possibilities.

Stock Raising.—Though Merced is not a dairy county, there is a large amount of cattle and sheep raised. The foothills and the low places of the watercourses in the valley are favorable to their fattening. The Assessor's report for 1892 shows 9,356 horses, 3,194 mules, 25,865 cattle, 6,496 hogs, 134,523 sheep, and 2,321 dozen poultry. When the West Side irrigation schemes are perfected and the systems for proper utilization of the soil are put in practice, as they should be, the stock production of cattle, hogs, and sheep could be quadrupled. The lands should be divided, watered, and the crops diversified, to give the best results.

Timber.—Merced is shut off from the big timber supply of the Sierra Nevada by Mariposa on the east, but when this large field is opened up the product must be handled either by flume or rail through Merced to the main line in the valley, and Merced will have the advantage of it.

Mining.—The same may be said of the mines. They lie in Mariposa County, but access to them must be had through Merced. There are indications of lignite, asphaltum, and coal oil in the Coast Range.

Prices of Land.—The prices range from \$10 to \$100 per acre. Immigration and development will demonstrate the great wealth of this county. That it is not far behind in the race, its present assessment roll clearly indicates.

MODOC.

Modoc County is bounded north by State of Oregon, east by State of Nevada, south by Lassen, and west by Siskiyou County.

Statistics.—Area, 4,296 square miles, or 2,750,000 acres. Lands assessed, 328,791.19 acres. Total assessed valuation of all property, \$3,295,682. Rate of taxation, State and county, 1.55. County property, \$8,000. County debt, \$869 06. Number of schools, 35. School children between 5 and 17 years, 1,349. School money, \$25,294 77. Population, census of 1890, 4,986.

County Seat and Principal Towns.—Alturas, the county seat, has a population of 600. Other towns are Cedarville and Fort Bidwell, in Surprise Valley, 400 population each; Adin, in Big Valley, 400 population; Lake City, Lakeview, Eagleville, Willow Ranch, Pine Creek. The county seat has good county buildings, two churches, two newspapers, six stores, two hotels, and schools.

Topography.—Of the total area of the county, 1,500,000 acres is mountainous land, and 1,250,000 acres valleys, plateaus, and lakes. The elevation of the valley lands ranges from 4,000 to 5,000 feet above sea-level, and some of the mountains are 7,500 feet. Warner range of mountains runs north and south through the eastern part, on the western slope of which are Goose Lake, Hot Springs, and smaller valleys. Big, or Round Valley, is about 30 miles by 15; Surprise Valley is 60 miles by 15, and contains three good size

lakes; Goose Lake is 50 miles by 10. The lava beds are in the northeastern part of the county, full of crevasses and caverns, and fit only for grazing. Pitt River drains the valley lands and empties into the upper Sacramento River. Numerous lakes are distributed throughout these valleys.

Soils.—Surprise Valley is a rich, black loam. Goose Lake Valley is covered with bunch grass; Round Valley varies from red to dark loam, with some rich bottom land on creeks. The foothill bunch grass land is easily worked, generally sandy loam with patches of adobe, and is mainly of volcanic origin, tufa and lava; good soil when irrigated.

Climate.—The climate is that of the temperate zone east, though milder in winter; occasionally zero in winter and 100° in summer. Snowfalls vary from 15 inches in valley, to 10 to 15 feet in mountains. Snow soon leaves the valley lands. Average rainfall, Fort Babbitt, 11.80 inches; Fort Bidwell, 20.06 inches.

Irrigation.—Irrigation is necessary for fruits and vegetables, but is seldom resorted to, owing to sparseness of population and remoteness from market. The county is well watered. Drinking water is from wells, varying from 6 to 30 feet deep.

Agriculture.—The county could produce abundantly the cereals, alfalfa, and timothy. Much of the latter is raised. Grain yields from 20 to 25 bushels to the acre.

Horticulture.—No fruits are raised except for family use. Surprise Valley produces apples, peaches, pears, cherries, and small fruits. There would be no difficulty in increasing the product with profit, if markets were accessible. The fruit acreage is 280, of which 210 are in apples. Fruit yield in 1892, about 33 tons.

Stock.—Stock is the leading industry. The Assessor's report shows 12,306 horses, 533 mules, 10,374 sheep, 3,559 hogs, and 45,699 cattle.

Timber.—Pine and cedar are in great quantities on Warner range.

Prices of Land.—Cultivated lands sell at from \$5 to \$15 an acre. Railroads would change the face of this entire section.

MONO.

Mono County is bounded northwest by Alpine, west by Tuolumne, Mariposa, and Fresno, south by Inyo County, and east by the State of Nevada.

Statistics.—Area, 2,796 square miles, or 1,789,440 acres. Unentered Government land, 900,000 acres. Lands assessed, 110,418 acres. Total assessed value of all property, \$908,971. Rate of taxation, State and county, 2.25. Number of miles of railroad, 33.37; assessed at \$71,317. County property, \$30,500. County debt, \$15,000. Number of schools, 9. School children between 5 and 17 years, 306. School money, \$8,818 71. Population, census of 1890, 2,016.

County Seat and Principal Towns.—Bridgeport is the county seat; population, 700. Bodie, population 202, and Benton are other towns. Bodie was once the scene of a large and active population in early mining days. It is the highest town in the United States—at 9,000 feet elevation.

Topography, Soil, etc.—Mono is mainly volcanic. It is a mixture of rugged mountains, alkali flats, and dead sea waters. The Sierra, on the west, reaches an altitude of 13,000 feet in Mounts Dana, Lyell, and Castle Peak. The White and Inyo Mountains traverse the eastern part of the county. Mono Lake, of unusually strong chemical waters, 10 miles wide by 15 miles long, is in the center of the county. In the south are the headwaters of Owens River. The north is scantily watered by the forks of Walker River. The only lands for tillage are found in the valleys on the western slope, small alluvial tracts on Owens and Walker Rivers and on streams emptying into Mono Lake. Several thousand acres might produce by irrigating. These lands, 5,000 to 6,000 feet above the sea, are too high for cereals and fruit to any extent. Fruit trees do not flourish.

Agriculture and Stock.—Agriculture is not carried on to any extent. There are only 11 acres in fruit, and no new plantings. The stock reports of the Assessor show 1,771 horses, 129 mules, 5,841 cattle, 165 hogs, 21,038 sheep, and 256 goats.

Timber.—There are large quantities of pine and tamarack, but no developments are made of these resources, on account of lack of transportation and market.

Mining.—Bodie was the scene of great activity in old mining times, and about \$20,000,000 was turned out of the mines; but its glory has departed. Some silver veins are yet worked, the annual output being about \$500,000. The Carson and Colorado Railroad from Reno, Nevada, gives access to this county from the north.

MONTEREY.

Monterey County is bounded north by Monterey Bay and Santa Cruz, east by San Benito, Fresno, and Tulare, south by San Luis Obispo, and west by the Pacific Ocean.

Statistics.—Area, 3,328 square miles, or 2,129,920 acres. Unentered Government land, about 500,000 acres. Lands assessed, 1,109,394 acres. Total assessed valuation of all property, \$18,268,789. Rate of taxation, State and county, 1.25. Number of miles of railroad, 141.61; assessed at \$1,341,922. County property, \$87,000. County debt, \$170,000. Number of schools, 124. School children between 5 and 17 years, 4,986. School money, \$126,972 64. Population, census of 1890, 18,658.

County Seat and Principal Towns.—Salinas City, the county seat, has 2,327 population, banks, hotels, fine business blocks, warehouse, mills, newspapers, schools, and churches. It is lighted by electricity, and provided with modern improvements. Monterey has started up the past year and built a new bank, fine school house, and made other improvements. Pacific Grove has built 300 dwellings and other buildings. Monterey, Pacific Grove, and Del Monte Hotel are connected by street railway, which will soon apply electric power. Other thriving towns in the interior valley are King City, in a rich grain center, with a flour mill of 700 barrels capacity; Castroville, Chualar, Gonzales, Soledad, Bradley, and San Ardo.

Transportation.—The Salinas Valley is traversed by the Southern Pacific system, with its branches to Monterey and Santa Cruz, and the main line will, when complete junction is made through the Santa Margarita range, become the main transit route to Los Angeles and Santa Barbara. A line is now projected, and will soon be built, from this county across the San Joaquin Valley to Fresno.

Topography.—The Santa Lucia range, rugged and reaching 5,000 feet altitude, traverses the entire western part of the county from north to south, and is about 20 miles wide. The Gabilan range, less lofty and more sloping, occupies the eastern portion, with the large Salinas Valley between the two, which is 75 miles long and 10 miles wide, and is traversed by the Salinas River, flowing northwesterly into the Pacific Ocean at Monterey. There are numerous tributaries to the Salinas. The Pajaro River is on the northern boundary of the county. Many small fertile valleys also exist, like Pajaro, Carmel, Carneros, and San Miguel Cañons.

Soils.—The main 640,000 acres of tillable lands lie in the Salinas Valley. The soil along the rivers is black adobe alluvium, very rich; back of that, more sandy loam, very deep and easily worked; then table lands, excellent for cereals; and lastly, the uplands. These are all highly productive.

Climate.—The climate is very equable and delightful. At Salinas City five years' observations show summer extreme temperature, 88°; winter extreme, 29°; summer mean, 60°; winter mean, 49°. No more healthful climate can be found. The annual rainfall is between 12 and 13 inches. Monterey and Pacific Grove are genial and enjoyable the entire year.

Irrigation.—No irrigation by ditch system is practiced, wells and windmills being used when irrigation is required.

Agriculture.—The Salinas Valley is noted for its great yield of wheat, barley, and oats, averaging from 40 to 60 bushels an acre. Vegetables reach enormous size and great perfection. The Burbank seedling potatoes of this section equal the Oregon product, and bring top prices in the San Francisco market. The soil is well adapted to hops, beans, sweet potatoes, tomatoes, sugar beets, and many other products.

Horticulture.—The principal fruit section is in the Salinas Valley. Many acres of vineyard produce the finest table and wine grapes. The orchards are very prolific, the leading acreage being in prunes, then apricots, apples, peaches, pears, plums, cherries, and almonds. Olives will thrive as well as on the Mediterranean, though no extensive plantings have been made. There are no local canneries, and a long and expensive haul to market has prevented extensive shipments. There are 2,466 acres of fruit trees, of which 1,580 are bearing and 886 not bearing.

Stock.—The large area of sloping hills of this county affords fine range for stock, and much capital is invested in this interest, mainly in cattle. The Assessor's report shows 12,963 horses, 185,257 cattle, 9,477 hogs, 346 mules, 16,619 sheep, 1,805 goats, and 2,448 dozen poultry.

Timber.—A large area of redwood exists near the coast, also tracts of yellow pine. Oak timber is scattered over the hills and mountains and is abundant for fuel.

Minerals.—Gold and silver are found in some cañons, but not yet much developed in paying quantities. The Los Burros, in the southwest, are becoming prominent in development. In Cholame Valley, in the southern part of the county, are deposits of asphaltum, copper, gypsum, and black oxide of manganese. Petroleum indications are very extensive. Lignite coal of good quality abounds, and mines have been opened at Carmelito. Glass sand is inexhaustible on the beach near Monterey, and large shipments are made to San Francisco.

Fishing.—Monterey Bay contains about one hundred and fifty species of food fish, and many are annually taken for market. There is a whaling company at Monterey, and some seasons as many as forty whales are captured.

Health and Pleasure Resorts.—Hotel Del Monte, near Monterey, is too widely known to require a detailed description. It is one of the finest watering places in the world, open the year round, with magnificent buildings to accommodate about one thousand guests; it is surrounded by immense groves, with 126 acres of garden, shrubbery, lawn, and flowers, in close proximity to the ocean, and provided with every comfort and means of enjoyment.

Pacific Grove, near by, and connected by car lines with Del Monte and Monterey, has some ten thousand visitors every season, and is a city among the pines, with 8 miles of paved and graded streets, elegant villas and cottages, and every convenience for comfort and enjoyment.

Prices of Land.—The settler who cannot find some place to suit his requirements within the boundaries of Monterey County must indeed be hard to please. He can secure the most fertile soil and a faultless climate on the most reasonable terms. In the southern part of the county are many cheap lands.

NAPA.

Napa County is bounded north by Lake and Yolo, east by Yolo and Solano, south by Solano, San Pablo Bay, and Sonoma, and west by Sonoma County.

Statistics.—Area, 789 square miles, or 504,960 acres. Unentered Government land, 25,000 acres. Lands assessed, 411,378 acres. Total assessed valuation of all property, \$14,721,017. Rate of taxation, State and county, 1.30. Number of miles of railroad, 47.43; assessed at \$780,551. County property, \$130,000. County debt, \$96,000. Number of schools, 52. School children between 5 and 17 years, 3,604. School money, \$74,756 63. Population, census of 1890, 16,304.

County Seat and Principal Towns.—Napa City, the county seat, has 5,000 population. It is located on Napa River, at the head of navigation, 45 miles from San Francisco, with which it is connected by rail. There are nine churches, two banks, college and schools, three newspapers, tanneries, flour mills, cream tartar factories, cannery, fruit drier, brandy distilleries, wineries, etc.

St. Helena, population 1,705, has many fine business blocks, excellent and popular hotels, eight churches, three banks, two newspapers, and many large wineries, one with a capacity of over 3,000,000 gallons.

Calistoga, at the head of the valley, and the terminus of the railroad, is surrounded by fine vineyards. Other towns are Oakville, Yountville, Rutherford, Monticello, and Knoxville, all centers of prosperous farms, orchards, and vineyards.

Topography.—The county is 45 miles long and 15 wide. Through the center, from north to south, runs the Napa Valley, from Mount St. Helena, 4,500 feet high, at the north, to San Pablo Bay at the south, varying in width from 1 to 5 miles. Browns Valley comes into Napa Valley on the western side, northwest of Napa City. On each side, east and west, runs a chain of mountains, with sloping foothills, numerous spurs, and intervening small valleys, all rich and productive and possessing a genial climate. Napa River runs through the main valley from north to south. The two ranges unite in one at Mount St. Helena. East of Napa City, across the Howell Mountain range, lies Pope Valley, and over a low divide, south of the latter, Chiles Valley, the two, jointly, about 20 miles long. Along the east line of the county lies Berryessa Valley on the eastern slope, 20 miles long. Other small valleys are Capelle, Gordon, and Wooden.

Soils.—There are five classes of soils. That of the mountain, argillaceous and not very productive. In Berryessa and Chiles this is mixed with rich loam, and adapted to cereals. Adobe is found only in spots in Berryessa, Pope, Chiles, and Browns Valleys. Napa Valley is principally rich alluvial loam adapted to all growths. From Napa City southward and along the bay is tule soil. Decomposed volcanic formation, like lava, prevails in the vicinity of Howell Mountain, and is excellent for grapes. The soils of Napa Valley extend well up into the foothills, which are clothed in vines, and the best wines are produced on them.

Climate.—Napa climate is delightful, the thermometer rarely higher than 90°. In winter frosts occur rarely, except in the valleys, and then doing little injury. In the foothill thermal belt citrus and other sub-tropical fruits do well. The rainfall averages between 25 and 31 inches a year.

Agriculture.—The soils of the valleys yield heavily in cereals, and much grain is raised in various localities, especially in Pope and Berryessa Valleys. Any vegetable product can be successfully raised, for which a market can be found.

Horticulture.—The leading industry of Napa County is grape growing for wines, but all deciduous fruits are successfully and profitably grown, and in these rich soils are very productive. There are 3,260 acres of fruit trees—1,579 bearing and 1,681 not bearing. Of this acreage, 1,127 are in prunes, 845 in peaches, 261 in apples, 260 in cherries, 105 in olives, 286 in pears, 77 in almonds, 12 in English walnuts, and the remainder scattering. The chief fruit sections are Calistoga, Browns Valley, Oak Knoll, and St. Helena; 3,000 orange trees are planted near the latter place, and are doing well. The Napa Valley is particularly well adapted to the olive, and many orchardists are making large ventures in these trees, which dread equally excessive cold or hot weather. The shipments of cherries East last season were eleven carloads. Fruits are marketed green, dried, or sent to the cannery. The prune will soon lead all other green fruit.

Viticulture.—The leading product of Napa County is wines. There are 16,651 acres of vineyard. The crop last year was light, only 27,083 tons; the wine product, 2,000,000 gallons. Napa County wines have a world-wide reputation. Its clarets, sauternes, hocks, rieslings, and burgundies are unsurpassed, and are in demand not only for Eastern but foreign shipment, being highly esteemed for their purity and bouquet. Such wines as this county and other equally favored sections of the State produce, should be in such demand as to drive out of the Eastern markets all the vicious, adulterated, and injurious foreign importations which travel under the name of wine, protected by foreign labels, manufactured mainly of prune juice from the Mediterranean, with potato spirits from Germany, and just sufficient good wine added to give them a saving flavor.

Stock Raising and Dairying.—Stock raising is carried on extensively in Napa County. There is abundant green, nutritious food, and much pains are taken to raise the grades of stock to a finer quality all round. Thousands of dollars are also invested in dairying, in stock ranges, buildings, and improved machinery and appliances. To this end much attention is given to alfalfa growing, to supplement the already excellent natural grasses. The Assessor's report shows 6,870 horses, 14,456 cattle, 4,185 hogs, 505 mules, 18,879 sheep, 975 goats, and poultry to the amount of \$17,025, ranking the sixth in the State.

Timber.—The mountains of the county were once covered with fir, pine, cedar, oaks, and madrona, and the valleys with oaks; but clearing for vineyards and orchards, and the long uses of forty years so near the center of population, have consumed a large proportion. Fuel is still reasonable in price, however.

Minerals.—The county has very little mineral apart from quicksilver deposits, and those not of much importance.

Health and Pleasure Resorts.—Napa City is a great favorite for residence with San Francisco business men, and many elegant homes are found there. The hotels are first class both here and at St. Helena and Calistoga. Near the latter place are hot springs. The balmy air, genial and healthful climate, and beautiful scenery, make a residence or sojourn anywhere in Napa Valley very delightful. The best educational and religious advantages are to be found in its towns, and the inhabitants are a social, refined, and cultured people.

Prices of Land.—Unimproved lands, according to quality, are from \$7 50 to \$150 an acre; improved, from \$100 to \$300, under same conditions. Full-bearing orchards and vineyards pay a good interest on valuation of \$500 an acre.

NEVADA.

Nevada County is bounded north by Yuba and Sierra, west by Yuba, south by Placer, and east by the State of Nevada.

Statistics.—Area, 1,125 square miles, or 720,000 acres. Unentered Government land, 250,000 acres. Lands assessed, 306,354 acres. Total assessed valuation of all property, \$5,847,974. Rate of taxation, State and county, 2.45. Number of miles of railroad, 49.03; assessed at \$608,129. County property, \$105,000. County debt, \$7,000. Number of schools, 81. School children between 5 and 17 years, 4,343. School money, \$79,060 47. Population, census of 1890, 17,375.

County Seat and Principal Towns.—Nevada City, the county seat, population 2,425, depends on mining and fruit. It has fine county buildings, good schools, elegant hotels, churches, theater, two daily newspapers, bank, and about twenty quartz mills.

Grass Valley, the oldest quartz mining town in the State, population 4,032, has three daily newspapers, bank, five churches, hotels, and many large business houses and factories. It is a very prosperous town. These two towns are connected by railroad with the main line of Central Pacific Railroad at Colfax.

Truckee, on the main line of the Central Pacific Railroad, 6,000 feet altitude, population 1,350, is mainly an ice and timber center, and has good hotels and business buildings, schools and churches, and six saw mills.

Other towns are Boca, the seat of a large brewery and the center of ice shipments; North San Juan, North Bloomfield, and Cherokee, three mining centers.

Topography.—The county extends from the valley of the Sacramento to the summit of the Sierra; western elevation, 1,000 feet; eastern, 8,000 feet; Grass Valley and Nevada, about 2,500 feet. About 250,000 acres of land fit for tillage lies in the western portion of the county. The central part is rolling hills and small valleys, fit for fruit culture, and abounding in mineral deposits. The eastern part is mountainous, and in perpetual snow. The Middle Yuba bounds the county on the north, and the South Yuba and Bear Rivers bound it on the south, all flowing into the Sacramento River. There are inexhaustible water supplies in the snows of the mountains, in the streams, and in the splendid upper reservoir sites, which have been extensively taken up and utilized.

Soils.—The lower foothills are mainly reddish or granitic loams, free from rocks, and easy to cultivate, very fine fruit land, and adapted somewhat to grain for hay. Around Nevada City and Grass Valley granite comes to the surface, which is much decomposed, is mingled with alluvium, and forms excellent soil for fruits and vines. The upper hills have also good loamy soil, producing heavy growth of forest trees and chaparral.

Climate.—A varying altitude from 1,000 to 8,000 feet gives great variety of climate. In the extreme summer, when hot in the foothills by day, the air in the mountains is cool and bracing, while at night even the lower altitudes are cool. Winter in the western portion never shows below 25° to 30°; in the mountains it is arctic in severity, and the snowfall tremendous. Grass Valley and Nevada City are a medium between these two, though the winters seldom show a cold below 20°, while the summers are much cooler than the plains below. Average annual rainfall for the central portion, about 50 inches; western extremity, not much varying from 25 inches. No failures ever occur from drought.

Irrigation.—There is little irrigation practiced. The ditch system of the county is enormous. The reservoirs, ditches, and flumes were originally constructed for mining, but the water is now used for irrigation and water supply of the towns, and for power for machinery. Storage reservoirs aggregate 2,297 acres, with about 6,000,000,000 cubic feet capacity. Main ditches amount to 783 miles. No part of this county need suffer for lack of water. The system is extended into Placer County, where the water is used for irrigation.

Agriculture.—Cereals grow well in the western part of the county. About 2,500 acres were seeded for 1892. Corn yields 60 to 75 bushels per acre. Large crops of alfalfa and red clover are raised, three crops being cut in a season, and the fourth making pasture. Vegetables will bring from \$250 to \$300 per acre, with proper cultivation. Two crops of potatoes a year can be had with irrigation.

Horticulture.—Much fruit is raised, especially apples and Bartlett pears. The total output of fruit in 1892 is estimated at about 3,000,000 pounds, mostly taken for shipment

green to the Eastern market. There are 1,678 acres in trees—1,005½ acres bearing and 672½ not bearing. Apples and Bartlett pears are the surest, because not liable to frost injury like peaches and apricots, and because of better adaptation of soil to their growth. Grapes for table use grow prolific and of exquisite flavor and fine keeping qualities.

Stock and Dairying.—Much stock is raised and fine butter made in the high altitudes of the Sierra in summer, with every advantage of clear, pure water, cool weather, and abundant nutritious grasses. Assessor's report shows 2,936 horses, 6,032 cattle, 710 hogs, 88 mules, 1,930 sheep, and 975 goats.

Timber.—The mountains are thick with sugar and yellow pine, fir, spruce, and cedar. The Truckee basin yields about 50,000,000 feet of lumber yearly through the six mills of Truckee.

Mining.—This is one of the foremost mining counties in the State. The first discovery of gold in quartz was made in 1850 at Grass Valley, and since that time quartz mining has been continuously and profitably followed. It is estimated that the quartz mines in the Grass Valley district have produced \$100,000,000 in gold bullion. There is a wide field yet for the investment of capital, not only in the purchase of working mines, but in the discovery of new lodes. The auriferous gravel deposits are the most extensive in the State, but owing to litigation are not now being worked. It is expected that the United States Commission of Engineers may submit a plan by which mining can be resumed by building restraining dams.

ORANGE.

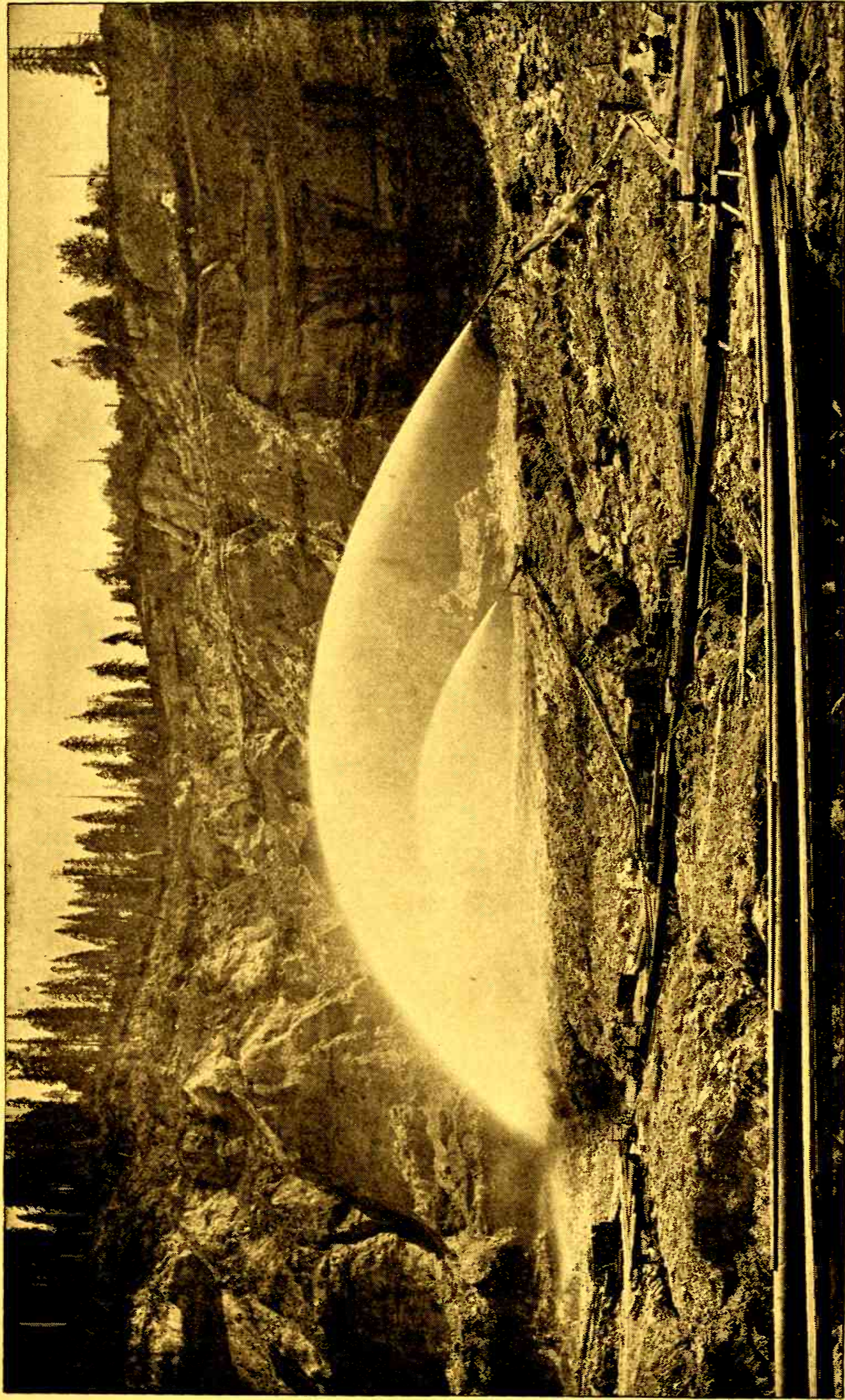
Orange County is bounded north by Los Angeles, east by San Bernardino, south by San Diego, and west by the Pacific Ocean.

Statistics.—Area, 675 square miles, or 429,502 acres. Lands assessed, 429,502 acres. Total assessed valuation of all property, \$10,060,190. Rate of taxation, State and county, 1.30. Number of miles of railroad, 86.78; assessed at \$600,817. County property, \$6,700. County debt, none. Number of schools, 74. School children between 5 and 17 years, 4,157. School money, \$96,523 28. Population, census of 1890, 13,564, which the last school census, taken in May, 1893, indicates to have increased to about 20,000.

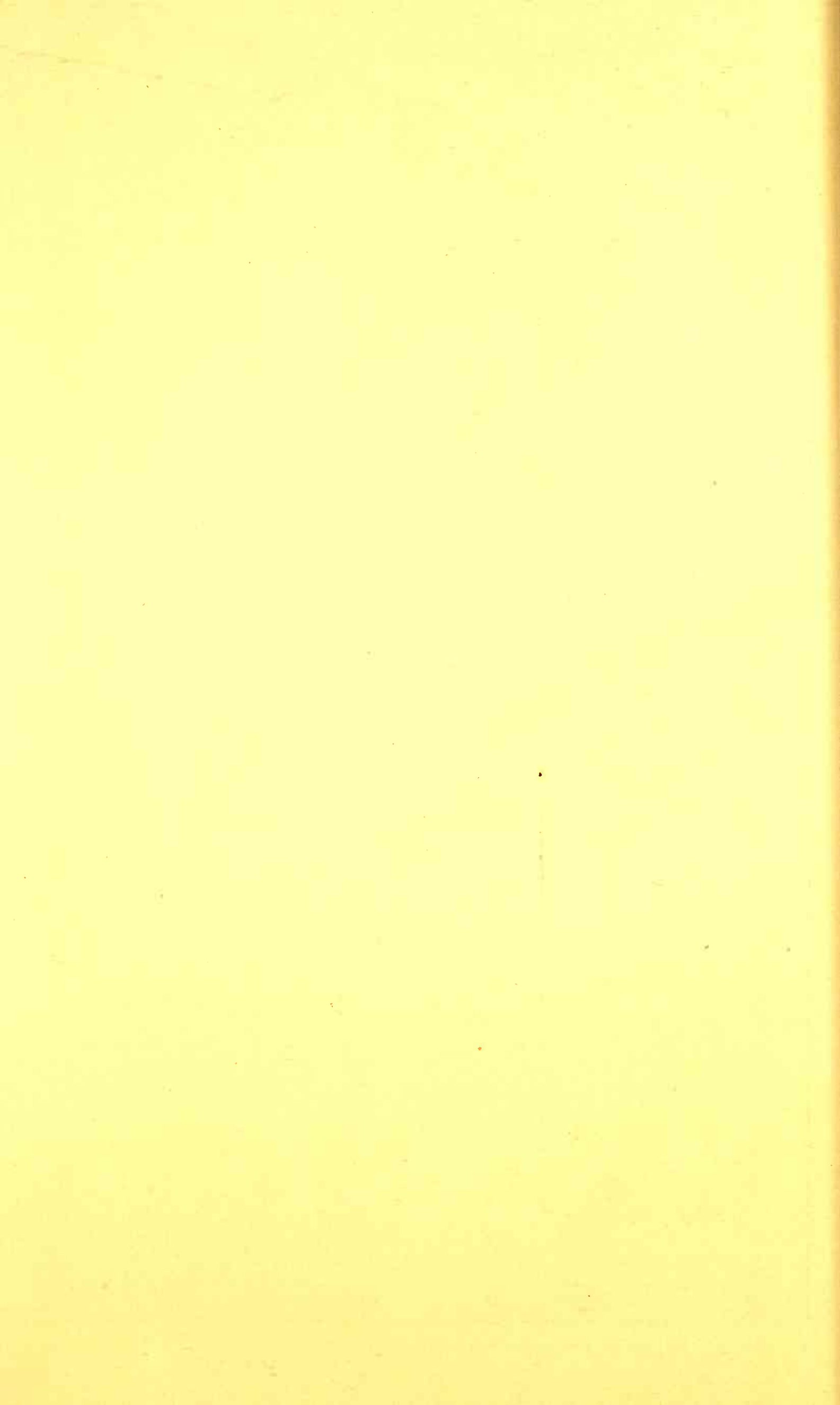
County Seat and Principal Towns.—Santa Ana is the county seat; population (1890), 3,628. The main street is built up almost solidly with substantial structures. Tasteful residences in beautiful grounds extend for miles in every direction. There are electric lights, waterworks, street car lines, three banks, good hotels, ten churches, and excellent schools, also two foundries and a planing mill. The cutting up of the San Joaquin Ranch would add much to the progress of Santa Ana. Orange and Tustin are practically suburbs of Santa Ana, being connected by street car lines, as well as railroads. They chiefly consist of ideal homes, although each place has a business center. At Orange there is a college. From three railroad depots large quantities of products are shipped. There are several fruit packing houses. Tustin is on the edge of the San Joaquin Ranch, which is shortly to be irrigated and subdivided. Around McPherson and Modena are many raisin vineyards. At Olive there is a tunnel 700 feet long, for irrigation purposes. A large flouring mill is run by water power.

Anaheim, founded as a vineyard colony by Germans from San Francisco, thirty-five years ago, is now the second city in the county; population (1890), 1,273. Around Anaheim is a rich farming country, where products of every variety are raised, from alfalfa to oranges. The irrigation systems are complete. About 1,000 carloads of products are shipped annually. There are churches, schools, opera house, hotels, a large brewery, fruit driers, grist mills, planing mills, brickyards, and a bank. A coöperative beet sugar factory is to be built in the neighborhood.

Fullerton is a young town, which has made rapid growth. There is an irrigation system, and large quantities of vegetables, fruits, and other products are shipped. There is a cannery, two packing houses, large brick schoolhouse, church, and several solid business houses. At Buena Park is a condensed milk factory. Between Santa Ana and the ocean is a level tract of fertile country, well watered from artesian wells. The chief centers are Westminster and Garden Grove. On the coast is Newport Landing, a summer resort and shipping point. North of the landing are Newport and Fairview.



HYDRAULIC MINING. Boston Mine, Nevada County; bank, 700 feet high; 2,500 inches of water; Monitor, 9 inches in diameter at nozzle,



In the extreme southern corner of the county, in a pretty little valley just back from the coast, is San Juan Capistrano, with extensive ruins of the old mission. Some fruit is raised here, but there has been little development. Just beyond, on a high bluff overlooking the ocean, is San Juan, a townsite laid out during the land boom of 1887.

Arch Beach, with a hotel, and Laguna Beach, are favorite seaside camping places and resorts. Irvine, Modjeska, and El Toro are stations on and near the San Joaquin Ranch. In the Santa Ana Mountains is Silverado, a silver and galena mining camp.

Topography, Soil, and Climate.—Orange is a small county, but in compensation for this, a large proportion of its area is arable, there being comparatively little steep mountain land. There are 65 square miles of mountains, 100 of foothills, and 510 of valley. The climate is mild and equable, no point being more than 20 miles distant from the ocean. It does not materially differ from that of Los Angeles County, and need not further be described. The soil is exceedingly fertile, and in the northern portion of the county irrigation facilities are ample, there being 100 miles of ditches and over 1,000 flowing artesian wells. In the south, one fourth of the area of the county is taken up by the great San Joaquin Ranch of 107,000 acres, which is at present devoted almost entirely to the raising of barley and cattle. In the mountains are deposits of galena, silver, quicksilver, coal, and other minerals.

Agriculture.—The barley crop of this county is about 50,000 tons, and of corn 6,000 tons. From one point in this county, 100 carloads of cabbage were shipped East this season. On the peat lands between Santa Ana and the ocean, crops of vegetables are raised which surpass belief. A large acreage is devoted to sugar beets.

Horticulture.—Everything natural to a semi-tropical climate flourishes in the county. Oranges, raisins, apricots, walnuts, and wine are the principal fruit products. Formerly wine grapes led in importance, but the vines have now given place largely to walnuts, which have become a specialty around Santa Ana. The crop of last season was valued at \$100,000, although only a small portion of the orchards is yet in bearing. The apricot crop was worth \$140,000, and the orange crop will swell the total fruit receipts to over \$1,000,000. Over 500 carloads of oranges were shipped in one season recently. The Southern California line carried out of the county last year 322,000 pounds of dried fruit. The orchard acreage of the county is about as follows: Oranges, 5,412 acres; walnuts, 2,592; prunes, 1,788; apricots, 1,492; peaches, 1,203; apples, 128; pears, 803; figs, 82; total acreage, 15,174; bearing, 12,206; not bearing, 2,968.

Stock Raising.—The climate of Orange is particularly adapted to live stock. There are several stables of fine racing stock, some of which have achieved a national reputation. Near Santa Ana is one of the best race tracks in the State, where many tests of speed are made.

Irrigation.—For fruit raising irrigation is necessary. The water supply appears to be ample. Besides the Santa Ana River, Santiago Creek, and other streams, there are about one thousand flowing wells in the Santa Ana plains, water being found at depths varying from 40 to 250 feet.

Mining.—In the Santa Ana range there are both gold and silver deposits. Oil deposits have been found near Fullerton, and coal on Santiago Creek and its tributaries. Bitumen, limestone, cement, pottery clays, and gypsum abound.

Transportation.—The Southern California's San Diego line traverses the entire length of the county, with a branch from Orange to San Bernardino County. The Southern Pacific extends to Santa Ana and Tustin, and there is a small independent railroad from Santa Ana to Newport, where coast steamships call.

This county, small in area, is rich in resources, thickly settled, with a prosperous population, and well illustrates what small subdivisions of land, with irrigation, the proper climate and soil, high cultivation, and intense farming will accomplish in California. On account of these conditions, the prices of land are naturally high, but not above their income product.

PLACER.

Placer County is bounded north by Yuba and Nevada, west by Sutter, south by El Dorado, and east by Lake Tahoe and the State of Nevada.

Statistics.—Area, 1,429 square miles, or 915,000 acres. Unentered Government land, 150,000 acres. Lands assessed, 575,989 acres. Total assessed value of all property,

\$10,275,060. Rate of taxation, State and county, 1.70. Number of miles of railroad, 116.47; assessed at \$1,986,823. County property, \$35,000. County debt, \$2,148 66. Number of schools, 71. School children between 5 and 17 years, 3,010. School money, \$62,602 60. Population, census of 1890, 15,089.

County Seat and Principal Towns.—Auburn, the county seat, population 1,612, altitude 1,360 feet, is a famous resort. There are two banks, three newspapers, opera house, agricultural buildings, fruit-shipping houses, schools, college, and fine first-class hotels. It is lighted by electricity, has a splendid water system, and, since its incorporation, has taken many steps of progress.

Newcastle, 956 feet altitude, is the largest shipper in the county, having four large fruit-shipping houses; shipments for 1892, 14,132,143 pounds. It is well provided with hotels, school buildings, churches, and business buildings, and one newspaper.

Penryn, 626 feet altitude, stands next to Newcastle in fruit shipments, with three fruit houses. Loomis, 400 feet altitude, is a good second, with three houses. Fruit shipments from Penryn, for 1892, 5,224,502 pounds; Loomis, 1,250,800 pounds; Auburn, 789,589 pounds; Colfax, 512,415 pounds. The large shipments from Newcastle is due to the fact that orchardists from the other sections ship from it. All the fruit shipped East in carloads from these stations is credited to Sacramento, as a railroad terminal point.

Lincoln, on the Oregon Division of the Central Pacific Railroad, is famous for its large pottery works, the output of which is enormous. It is also the center of a large wheat-producing section. Roseville and Sheridan are agricultural towns in the plains.

Colfax, altitude 2,422 feet, is also the center of much fruit production, especially grapes and pears, and many carload shipments are made.

Rocklin is a large producer and shipper of granite. Fine granite quarries are also worked at Penryn and Loomis. Towns in the mining region are Dutch Flat, Michigan Bluff, Forest Hill, Iowa Hill, and Ophir.

Transportation.—The main line of the Central Pacific Railroad traverses the county from east to west, and the Oregon Division of the same from Roseville north.

Topography.—Placer, like Nevada, is a narrow county, varying from 10 to 30 miles. It stretches in length from Roseville Junction, 163 feet altitude, in the plains, to the summit of the Sierra Nevada, 7,000 feet elevation. By regular gradations it rises between these extremes. The foothills proper begin between Roseville and Rocklin. The famous early fruit basin extends from Rocklin to Auburn, about 14 miles, and is included between a range of low granite hills about 2 miles north of the Central Pacific Railroad, and the Middle Fork of the American River, south of the railroad, about 7 miles distant at Loomis and about 2 miles at Auburn. The western part of the county, of which Sheridan, Lincoln, and Roseville are the center, is level land devoted to grain production. Above Colfax the mountains rise rapidly. The eastern portion of the county is mainly devoted to timber and mines. The famous Lake Tahoe lies partly in eastern Placer.

Soils.—In the valleys and plains of the western portion and up into the Penryn district of the foothills, the soil is a loose gray granitic loam, rich in potash, streaked here and there with red soil, very deep, and good for grain, hay, and fruits. From Penryn up to Colfax the soil is red from the presence of oxides of iron. As far east as Newcastle the soil is granitic; from thence to Colfax it is of slate formation. The soil, with the exception of rocky granite and volcanic hills here and there, is uniformly good, only needing thorough cultivation to produce excellent results.

Climate.—The temperature of the western portion up to Penryn is like that of Sacramento. The mercury in August sometimes shows 105° at 2 o'clock; in winter seldom below 30°, in extreme cases. The average temperature is as follows: At Auburn, winter, 46.2°; summer, 74.3°. Winter temperature falls as you ascend above Auburn, and summer diminishes also, though in a less degree. Winter is milder as you descend from Auburn to Rocklin. Snow falls sometimes from 10 inches at Auburn to many feet at the Summit, varying with the elevation; rarely at Auburn and below, and never remaining over one day. Frosts are rare and light in the fruit belt. In a word, imagine Florida in oranges, Delaware and New Jersey in peaches, New York and Ohio in table grapes, New England in granite quarries, and Maine in timber, and you get some idea of the range of Placer in climate and products. The nights in summer are always cool; the air is dry and bracing, and the general conditions are extremely healthful. The mountain districts are delightful and invigorating in the summer months.

Irrigation.—Irrigation from Colfax down to Roseville and Lincoln, on both slopes, is secured from the extensive system of the South Yuba Canal Company, embracing Yuba, Bear, and American Rivers. This combined system, with about 250 miles of ditch, pipe, and flume, gives abundant water for irrigation to the entire fruit region. The south-eastern part of the county is supplied from the American River.

Agriculture.—The agricultural products are mainly derived from 140,000 acres of the plains, devoted principally to wheat, barley, and hay. Wheat yields about 20 bushels to the acre. Hay is also largely produced throughout the foothills as high up as Colfax. Many alfalfa fields are found, cutting four crops a year, when irrigated. All vegetables yield largely throughout this entire section—potatoes, sweet potatoes, onions, tomatoes, cabbage, beets, carrots, turnips, peas, sweet corn, etc. Sheridan and Lincoln ship many tons of wheat and barley.

Horticulture.—The main product of Placer County is fruit. On the plains grow peaches, pears, apricots, almonds, plums, cherries, and small fruits. In the above described warm fruit belt from Rocklin to Auburn, you have the natural home of the peach. This is the leading fruit, then in order come table grapes, plums, olives, pears, apples, apricots, oranges, cherries, raisins, figs, almonds, and walnuts. The total acreage in fruit is 8,402, of which 4,826 is bearing and 3,576 not bearing. The shipments of fruit for 1892 were 21,909,452 pounds, or 1,125 carloads. The bulk of this fruit is shipped East green; very little is dried. There are no canneries in Placer County. The facilities for shipping East are so superior in this "gateway" county, that its fruits can be guaranteed to reach the Eastern market in perfect condition. Fruit picked in the morning crosses the Sierra Nevada the same night on its Eastern way, and so escapes the heat. One fifth of the deciduous fresh fruit shipments of California to the East, in 1892, was made from Placer County alone, mainly from a section 12 miles long and 5 miles wide. Placer is making a fine showing in oranges, of which she has 273 acres. She has carried off many first prizes at the various citrus fairs. The culture of this fruit is no experiment here, and the growing of citrus fruits will yet attain large proportions.

Stock Raising and Dairying.—Stock raising and dairying are important interests. Butter making is largely carried on, especially in the mountain ranges in summer, and the product is very fine. The Assessor's report for 1892 shows 4,292 horses, 5,525 cattle, 9,477 hogs, 198 mules, 51,080 sheep, 626 goats, and 1,957 dozen poultry.

Timber.—Much sugar and yellow pine, fir, spruce, and cedar are found in the mountains, and the lumber output from that section has been very large for many years. Oak and scrub pine abound all over the foothills, and fuel is plentiful.

Mining.—This county is one of the most prosperous. Renewed interest is being shown in its gold mines. If the provisions of the late law of Congress relating to hydraulic mining are effectual, the business of hydraulic mining will receive a great impetus. The principal districts are Ophir, near Newcastle, with its eighty or ninety quartz claims, but few of which are now operated, and Michigan Bluff, Forest Hill, and Iowa Hill, on the divide between the North and Middle Forks of the American River, above Colfax. New capital is taking hold of many good mines, and substantial increase in the gold yield may be looked for. The yield of gold for 1892 was over \$1,000,000.

Health and Pleasure Resorts.—Auburn, with its well-appointed hotels, its balmy air, and its beautiful scenery, is a noted place of resort for health and pleasure seekers. Lake Tahoe has a national reputation. It is well supplied with hotels, bathing and fishing conveniences, excursion steamers on the lake, and the finest mountain scenery to be found anywhere.

Prices of Land.—Good fruit and agricultural land in the county can be found at prices varying from \$20 an acre up to \$100, unimproved, and up to \$500 for improved in the fruit section, and much lower in more remote situations. The price depends on the section and proximity to the railroad.

PLUMAS.

Plumas County is bounded north by Shasta and Lassen, east by Lassen, south by Sierra, Butte, and Yuba, and west by Butte and Tehama Counties.

Statistics.—Area, 2,656 square miles, or 1,709,840 acres. Unentered Government land, 650,000 acres. Lands assessed, 358,810 acres. Total assessed valuation of all property,

\$2,272,251. Rate of taxation, State and county, 2.50. Number of miles of railroad, none. County property, \$18,000. County debt, \$46,200. Number of schools, 32. School children between 5 and 17 years, 1,000. School money, \$17,228 28. Population, census of 1890, 4,916.

County Seat and Principal Towns.—Quincy, the county seat, altitude 4,000 feet, has a bank, newspaper, and two mills. The other towns are La Porte, Prattville, Greenville, Taylorville, Beckwith, and Crescent Mills, all towns dependent on mining and stock raising.

Topography.—Plumas is a mountain county, in the heart of the Sierra, having Lassen Peak, 10,577 feet altitude, on the north, Pilot Peak, 7,605 feet altitude, and Spanish Peak within its borders. The county is traversed by mountain ranges, interspersed with cañons, valleys, and high rolling hills. The principal valleys are Mountain Meadow, Big Meadows, Indian, Genesee, Clover, American, Beckwith, and Butte. The forks of the Feather River drain the county and furnish an abundance of pure, cold water.

Soils.—The soil of the valleys is exceedingly fertile, and produces anything compatible with the climate.

Irrigation.—Irrigation, where needed, is lavishly supplied by the mountain streams. Round Valley reservoir contains 1,000 acres.

Climate.—The summer climate is simply delightful, bracing and cool; very cool nights. The winters are severe as to snow, travel being cut off except on snow shoes, but the temperature is milder than at the East.

Agriculture.—Agriculture is confined to clover and timothy hay for stock and dairy use, oats and barley for local needs, vegetables for home consumption. All these grow prolifically.

Horticulture.—Fruit is raised only for home consumption. Railroad connections would immensely increase the yield, for the soils produce abundantly, chiefly apples, then pears, plums, small fruits, and, in favored localities, peaches. The apples are perfection, as in almost all sections of California in the same altitude, 3,500 to 4,000 feet. There are only 85 acres of orchard, of which 60 are in apples.

Stock and Dairying.—Stock is raised extensively; many seek Plumas for summer cattle range, owing to the abundant natural grasses, timothy, and clover, and the pure, abundant waters. The choicest butter is made. The lack of transportation facilities hampers this industry, in common with all the others. The Assessor's report shows 2,328 horses, 10,485 cattle, 579 hogs, 22 mules, 538 sheep, and 420 dozen poultry.

Timber.—Sugar and yellow pine, fir, spruce, and cedar timber abound and are of great size and value. The magnificent forests only await transportation and modern appliances, though many districts are extensively worked.

Mining.—Gold mining is the leading industry. Many quartz and hydraulic claims have been opened and operated at great expense. Iron, copper, marble, asbestos, and other minerals are found. The future mining outlook is flattering.

Resorts.—The trout fishing of Plumas is unexcelled. The streams are cold and clear. Big Meadows is a famous resort for the devotees of rod and reel.

Prices of Land.—Prices of land are naturally very reasonable, owing to remoteness from railroads. Teaming and staging go by Chico or Oroville, in Butte County, to reach railroad connections.

SACRAMENTO.

Sacramento County is bounded north by Placer and Sutter, east by El Dorado and Amador, south by San Joaquin, and west by Yolo and Solano Counties.

Statistics.—Area, 968 square miles, or 619,520 acres. Lands assessed, 606,260 acres. Total assessed valuation of all property, \$34,375,159. Rate of taxation, State and county, 1.40. Number of miles of railroad, 90.25; assessed at \$1,115,889. County property, \$350,000. County debt, \$662,784 42. Number of schools, 76. School children between 5 and 17 years, 7,787. School money, \$189,601 79. Population, census of 1890, 40,508.

State Capital, County Seat, and Principal Towns.—Sacramento, the capital of the State and the county seat, has a population of 30,000. The principal towns are Folsom, population 1,435, connected by rail with Sacramento, location of branch State Prison, has one bank, newspaper, street car line, and a splendid stone dam across the American River; Galt, Elk Grove, Florin, and Brighton, on the railroad line between Sacramento and Stockton. These are all thriving agricultural and fruit centers. Courtland, Isleton,

and Walnut Grove, on the Sacramento River, are shipping centers of the most productive deciduous fruit district in the State.

Topography.—The topography of Sacramento is very simple. Included between the Sacramento River, its western boundary, the American River, near its northern boundary, and the Mokelumne River, its southern boundary, its entire area of 620,000 acres is almost all a rich alluvial plain from 30 to 75 feet above sea-level, gradually rising to meet the rolling foothills which commence in the extreme eastern portion of the county. The Cosumnes River, of less importance than the others, runs southeast through the southern half of the county and joins the Sacramento near Walnut Grove. There is much reclaimed tule land in the southwest portion of the county, along the Sacramento River, including Grand Island, where orchards are located which cannot be bought for \$1,000 an acre and have an annual rental value of \$100 and upwards.

Soils.—The richest and deepest alluvial soils lie along the Sacramento River, from Sacramento to Walnut Grove, and the reclaimed lands above mentioned. Similar lands lie on both sides of the American River from Sacramento up toward Folsom. As you go toward Florin, Elk Grove, and Galt the soil grows a trifle shallower and less rich, but has, however, great fertility, and is famous for orchards and small fruits. Much similar is the soil along the Cosumnes. As you approach the foothills in the east toward Folsom and toward Ione, in Amador County, more of the red soil appears, mixed with gravel. All of the latter, or with few exceptions, is excellent grain and fruit land. On these lands are the famous Natoma Vineyard, Orangevale Colony, and many fine vineyards and orchards.

Climate.—The mean annual temperature of Sacramento for years past is 60.5°. The highest temperature on any occasion is 104°, and that only for a few hours in the daytime, never interrupting work in the field, orchard, or town. This dry heat, with rapid evaporation and free radiation, and no moisture in the atmosphere, is more easily endured than 85° in the Eastern States. For forty years the average temperature of spring has been 54.9°. The nights are regularly cool. In ten years there have been but nine nights when the mercury was above 70°. There is an average of 244 cloudless days in the year. During the winter, or more properly the rainy season, running from November to May, with the greatest precipitation in December, January, and February, the temperature averages about 50°, and seldom in December or January falls below the freezing point of 32°. During the past twenty years the earliest fruit has blossomed as early as January 20th and as late as February 28th. Latest hurtful frosts in same period have ranged from January 9th to April 6th, and that extremely seldom.

Irrigation.—The only irrigation resorted to is pumping by wind, horse, or steam power from wells or from the rivers. Underlying the whole plains seems to be a body of pure water; practically inexhaustible, even with a delivery of 80,000 gallons an hour. Irrigation is never used in the orchards, but is sometimes resorted to for increasing the yield of Tokay and Muscat table grapes, always on strawberries and small fruits, and in most nurseries. Along the reclaimed and leveed lands on the Sacramento River it is never resorted to, except in the immense vegetable gardens, or for small fruits. An extensive dam and ditch system exists at Folsom, which it is proposed to extend through the county for irrigation, and mechanical power to the extent of 6,000 horse-power. The waters are supplied by the American River. The Orangevale Colony, on the north side, near Folsom, is supplied by a pipe system from the Middle Fork of the American.

Agriculture.—The lands along the Cosumnes River, in the vicinity of Galt and Elk Grove, extending up to near the foothills; the Norris Grant, of 45,000 acres, north of Sacramento City, and other outlying sections, are devoted mainly to raising wheat, barley, and hay, though the fruit productions are also considerable. Thousands of acres along the river bottoms are used for the production of all kinds of vegetables, which are shipped East in immense quantities by the carload, and even at times by the trainload, including cabbages, beets, carrots, lettuce, onions, asparagus, celery, common and sweet potatoes, and many other products. Vegetable lands often bring a rental of \$50 an acre a year along the Sacramento River. Many tons of tomatoes and peas are raised and shipped or furnished to the canneries. Along the Sacramento, American, and Cosumnes Rivers are the finest and most productive hop fields of the Pacific Coast. Alfalfa without irrigation grows luxuriantly along all the rich bottom lands, producing from 7 to 8 tons an acre a year. The production of grain hay and alfalfa hay is many thousands

of tons annually. Space fails to give any complete list of the agricultural products of the county. The following area was seeded for 1892: Wheat, 80,000 acres; oats, 400; barley, 45,000; corn, 6,000; hay, 45,000.

Horticulture.—The annual green fruit product is about 90,000,000 pounds, which would be an average yield of $4\frac{1}{2}$ tons to the bearing acre, equivalent to a gross yield of \$150 an acre, or say \$100 an acre profit. The leading fruit district of the county is on the Sacramento River, from the city down to Walnut Grove. Florin, Brighton, and Elk Grove are very important points; also, Routiers, Mayhews, Natoma, and Folsom, the latter two being mostly in vineyard products. Of all the fruits, peaches lead in acreage and production; then, in order, come pears, grapes, prunes, plums, apricots, almonds, oranges, cherries, figs, and olives. There are reported 195 acres of oranges, and these produce as good fruit as in any section of the State. The chief reliance, for profit and shipment, is on the peach, the Bartlett pear, and the Tokay, Emperor, and Cornichon grapes for table use, which are all, in their season, delivered in fine condition by refrigerator cars in the Eastern market, and bring the highest prices. The Bartlett pear crop of the Sacramento River is generally contracted for on the tree early in the season. The Tragedy prune, originating on the Sacramento River, yields immensely, and is a very profitable crop. The best orchards in this section cannot be bought for less than \$1,000 an acre, as they easily pay from 12 to 20 per cent profit on that valuation. There are 12,545 acres of fruit trees and vineyard in the county—10,055 bearing and 2,490 not bearing. Immense amounts of strawberries are raised annually around Sacramento, principally in the vicinity of Florin, the county standing second in this crop to Santa Clara County.

Stock Raising and Dairying.—The richness of the soil and the immense food products of this county facilitate the keeping of a large amount of stock of all kinds without the necessity of changing range winter and summer. For the same reason the stock is in better condition, and much finer blooded grades are owned. Several famous breeding farms are located near Sacramento, and many others are engaged in raising trotting and other fine stock, in a smaller way. Large quantities of butter of the finest quality are made on the river and in various parts of the county. Much stock is furnished for the slaughter-house. The poultry interest is also very profitable; and no insignificant amount of mutton and wool is produced. The Assessor reports 8,616 horses, 19,790 cattle, 6,410 hogs, 377 mules, 28,970 sheep, and 4,970 dozen poultry.

Sacramento City Manufactures.—The principal manufacturing of the county is done in Sacramento City. Aside from the Central Pacific shops, foundries, and furnaces located here, which employ 2,000 men and cover 25 acres, the city has six breweries, two wineries, two canneries, six flour and feed mills, planing mills, box factories, sash, door, and blind factories, soap works, agricultural machine works, carriage and wagon factories, iron foundries, boiler shops, machine shops, brass works, spice and coffee mills, manufactories for mineral waters, essences, flavoring extracts, and a hundred other articles of commerce.

Commerce.—The shipments by rail and river are immense. The fruit products alone of 1892 shipped from Sacramento by rail amounted to about 90,000,000 pounds, besides large amounts of potatoes, cabbages, and other vegetables, and 5,000,000 pounds of hops. Her total east-bound shipments for 1892 amounted to 130,000,000 pounds. The amount of lumber handled yearly is immense. Five Sacramento river steamers carry a large amount of freight, both up and down stream. The traffic in fish, brick, cement, and lime is very large. The manufacturing and jobbing trade of Sacramento is over \$60,000,000 a year. No more details are required to show her importance as a distributing center, and that she does not need to depend on her position as the capital and the railroad shops alone for her prominence and prosperity. Besides the beautiful buildings and grounds of the State Capitol, the city has fine county buildings, City Hall, waterworks, gasworks, electric light plants, and a complete system of electric street railways, well-paved and well-sewered streets, a splendid Government building now nearly completed, at a cost of \$150,000, excellent hotels, six banks, with millions of dollars of assets, whose loans are distributed over the entire Sacramento and San Joaquin Valleys; the magnificent Crocker Art Gallery, presented to the city, representing a value of \$650,000, and hundreds of elegant residences, surrounded with lawns, trees, shrubbery, and flowers. Her school buildings and churches are elegant and numerous, and her educational and religious

advantages unsurpassed. A company, recently formed, is now preparing to transmute the immense water-power of the Folsom dam into electrical energy, and transmit the same to Sacramento to run its street cars, light its streets and buildings, and furnish a large excess of power for general manufacturing purposes. This is the pioneer enterprise of this nature to be entered into on the Pacific Coast, and its success, which is as good as assured, will spur up the laggard energies of other capitalists in California to seize upon, divert, distribute, and control, for the prosperity of the people and their own immense profit, the many thousand horse-power of water which now flows through our unused rivers, idly wasted, to the sea.

Prices of Land.—Land can be purchased in Sacramento County all the way from \$50 an acre for grain and hay land, up to \$1,000 an acre for improved fruit lands of the Sacramento and American Rivers.

SAN BENITO.

San Benito County is bounded north by Santa Clara County, east by Merced and Fresno, south and west by Monterey.

Statistics.—Area, 1,056 square miles, or 675,840 acres. Unentered Government land, 150,000 acres. Lands assessed, 407,677.40 acres. Total assessed valuation of all property, \$6,318,775. Rate of taxation, State and county, 1.55. Number of miles of railroad, 17.65; assessed at \$165,042. County property, \$50,000. County debt, \$41,250. Number of schools, 54. School children between 5 and 17 years, 2,085. School money, \$75,480 62. Population, census of 1890, 6,390.

County Seat and Principal Towns.—Hollister, the county seat, has a population of 1,280, with bank, college, two newspapers, ten grain warehouses, with storage capacity of 900,000 bushels, mill, and good county buildings, schools, churches, and stores. Tres Pinos is the present terminus of the railroad. San Juan is the location of old Mission buildings.

Topography.—On the east is the Mount Diablo range, on the west the Gabilan Mountains. The land slopes from both these ranges to the valley of the San Benito River, which flows northwesterly through the center of the county and empties into the Pajaro River near Santa Cruz boundary. The river has several small tributaries. Though a large area may be classed as mountain, there is still much level land in the main valley for fruit. There are about 34,300 acres of first-class grain land, principally in what is known as San Benito Valley. This is a black, sandy loam or adobe, with blue or sandy subsoil, and holds moisture well; also about 46,000 acres of second-class grain land in the foothills, composed equally of adobe and sandy soil, not so strong as the valley land, but producing fairly well. This is the land that raises the famous Hollister hay. Finally, a large amount of hill land, excellent for pasture; most valley ranches take in a portion of this land also. The largest single body of fine land is in the northern part of the county, and constitutes the southern extremity of the Santa Clara Valley. Numerous smaller valleys are San Juan, Santa Ana, Quien Sabe, Los Muertos, Bear, Panoche, and Bitter Water.

Climate.—Though the Gabilan range intervenes, the climate is tempered by the ocean. Fogs are rare, but the ocean breezes in summer render the climate healthful and delightful. The temperature of Hollister averages 59.5°, with lowest extreme winter at 21°, and highest extreme summer 109°. Vegetables grow the year round. The nights are always cool. The annual rainfall is 12 inches, between November and April. In the mountains the rainfall is greatly increased.

Irrigation.—No irrigation is provided for, as the natural supply of moisture is sufficient, though, if necessary, a great portion of the valley could be irrigated at small expense. Over a large area artesian water can be readily obtained.

Agriculture.—A large quantity of cereals and general farm produce is raised yearly, and many tons of hay, grain, and vegetables are shipped to San Francisco and other points. The Assessor makes no report of acreage in cereals.

Horticulture.—There are 1,713 acres of fruit trees and vines—1,151 bearing and 562 not bearing. One of the oldest orchards in the State is at San Benito, planted in 1785. The leading fruit in acreage is the prune, next in order apricots, peaches, pears, and apples, then almonds, walnuts, grapes, cherries, figs, and olives. There are 3 acres of oranges.

Much attention has, of late, been turned from farming and stock raising to fruit culture, and with most gratifying results, yet no shipments of fruit are made from the county. Enough has been done to show that the county can produce a very wide range of excellent fruits.

Stock Raising.—This is a very thriving stock section, much attention being paid to excellent breeds of horses and cattle. The Assessor reports 8,041 horses, 28,684 cattle, 2,935 hogs, 182 mules, 22,830 sheep, 570 goats, and 2,702 dozen poultry.

Timber.—The timber product, except for fuel, which is abundant, is not important.

Mining.—The New Idria Quicksilver Mines, in the southeastern part of the county, have produced in the last thirty-four years 155,000 flasks, worth \$8,000,000. Antimony, gypsum, and other minerals are found.

Prices of Land.—Land can be bought very reasonably in this county. It is a very favorable place for settlement, considering the low prices of land, nearness to market, productive soil, and healthful climate.

SAN BERNARDINO.

San Bernardino County is bounded north by State of Nevada and Inyo County, east by the State of Nevada and Arizona Territory, south by San Diego and Orange Counties, and west by Orange, Los Angeles, and Kern Counties. This is the largest county in the State, three times as large as the State of Massachusetts.

Statistics.—Area, 23,476 square miles, or 15,024,640 acres. Unentered Government land, 5,000,000 acres. Lands assessed, 783,119 acres. Total assessed valuation of all property, \$26,751,114. Rate of taxation, State and county, 1.60. Number of miles of railroad, 628.39; assessed at \$3,513,040. County property, \$235,000. County debt, \$15,987. Number of schools, 155. School children between 5 and 17 years, 7,826. School money, \$326,669 27. Population, census of 1890, 25,486.

County Seat and Principal Towns.—San Bernardino, the county seat, population 8,000, is the oldest town in the county. It has three newspapers, three banks, two motor roads, 8 miles of street railway, an elegant Court-house in course of construction, first-class hotels, and business blocks. A State insane asylum is located here.

Riverside, the pioneer settlement in the orange industry, population 5,500, has a wealthy and enterprising class of citizens, beautiful homes, and magnificent drives. Magnolia Avenue, 15 miles long, lined with shade trees and ornamental plants, through the heart of the richest orange groves in the county, has a national reputation. Riverside has six banks, three newspapers, elegant hotels, and one of the finest opera houses in the State.

Colton, population 2,000, is the railroad center of the county. It has two newspapers, large cannery and packing houses, and the largest pavilion south of San Francisco.

Redlands is a growing and lovely town of 2,000 population. It has three newspapers, good hotels, fine residences and stores, and every promise of a prosperous future.

Ontario, population 1,600, has a fine street, Euclid Avenue, 200 feet wide and 7 miles long, lined with four rows of trees, and a gravity street car line its entire length.

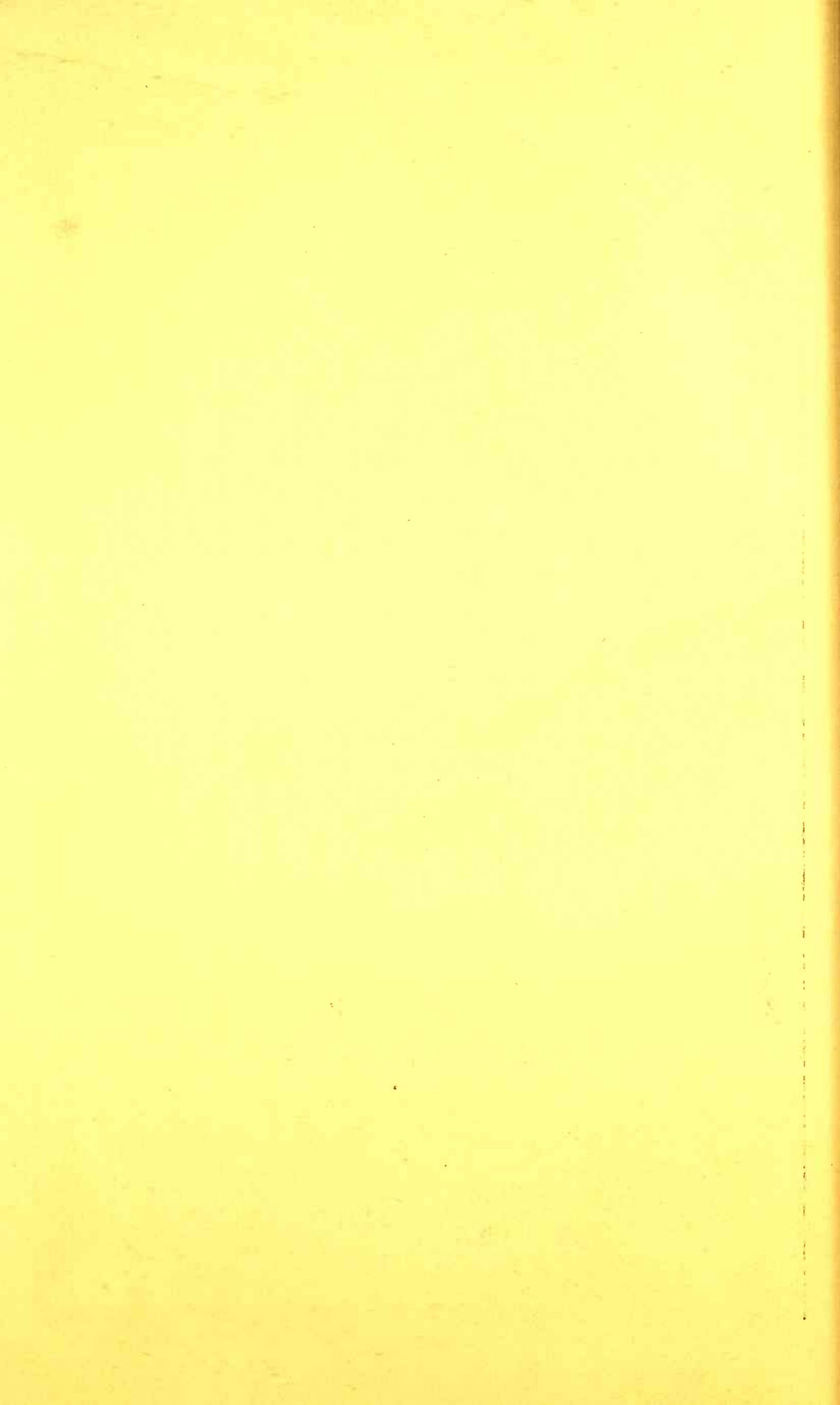
South Riverside, Chino, Beaumont, Banning, Highlands, and Rialto are all growing, enterprising towns, surrounded by orchards. Needles, Daggett, Barstow, Calico, and Victor are all mining towns of more or less importance.

Topography.—A large part of the area of the county is arid land, and wild, rugged mountains, abounding in mineral wealth. To the south and west of these lie nearly 1,000 square miles of vine-clad and orchard-covered valleys, well styled the Italy of America. In the range of mountains which separates this from the desert, Mount San Bernardino, elevation 10,225, and Mount Grayback, elevation 11,090 feet, are conspicuous features. The Mojave Desert is largely a sandy waste, with occasional volcanic mountain ridges and peaks and alkali tracts, without other growth than the yucca, small nut pines, and occasional juniper. Beds of dry lakes and creeks abound, hot springs, boiling mud lakes, salt beds, borax deposits, and sulphur.

Soils.—The soil of the arable portion varies from a sandy loam, mixed with gravel, on the high mesas or table lands, to a black, heavy damp loam on the river bottoms. The red soil of Redlands is characteristic of the foothills. Old San Bernardino has a heavy black loam; Riverside, heavy clay mixed with sand, and gravelly on higher



ALMOND ORCHARD.



portions; Rialto, a sandy and gravelly loam; Cucamonga, a light sandy soil; Ontario, a gravelly loam, warm and fertile; on the terrace at Colton, a rich, deep loam; on the river bottoms, a cold, damp clay. All these soils, except the alkali and river bottom damp clays, are first-class fruit lands.

Climate.—The widest range of climate is found in this vast area. The mountains, crowned with snow, and the elevated northern plateau, presents a winter climate like the East. South of the mountains a different climate prevails. At Highlands frost is almost unheard of; at Redlands a little occurs; at Ontario and Riverside a trifle more; never, in any case, doing much damage. San Bernardino City suffers more, on account of damper soil and lower altitude. The summer extreme of 105° is sometimes reached, but only a very few days in the year, and the air is always dry and modified after 2 o'clock by the influence of ocean air currents. The rainfall varies with topography—at Riverside, 8 inches a year; Redlands, more; San Bernardino, about 12 inches; at Bear Valley, rarely ever a less fall than 30 inches, sometimes as much as 100 inches. The rainfall of San Bernardino for 1891-2, November to May, was 16.85 inches. On the desert the precipitation is very light.

Irrigation.—But this county is not dependent upon rainfall and exhibits the wonderful and magic influence of its great irrigation system. The first attempt to utilize the water was in 1870. In 1880 the acreage capacity of the principal irrigation systems was 16,000; in 1890, 128,700. The irrigating ditches extend 250 miles. In the past year \$750,000 has been expended in developing other systems. At present 430,000 acres are under irrigation, of which 55,000 are directly and 375,000 indirectly irrigated. The larger part of the Bear Valley water is piped. Almost all the works of this county were originally built with the direct view of irrigation and not for mining. A new system, soon to be built, will reclaim, by the Mojave River water, 200,000 acres of arid, though fertile, desert lands. There are also 400 flowing artesian wells in the county from 100 to 400 feet deep. Fruit lands require from one tenth to one eighth of a miner's inch of water per acre every month during summer. The charges for water are low, and in many cases water rights go with the land.

Agriculture.—Acres sown for crop of 1892 reported: wheat, 3,860; oats, 10; barley, 90,450; corn, 552; hay, 31,240. Barley is grown largely about Beaumont, but not so much as formerly. Sugar beets are grown extensively at Chino, where are situated the largest beet sugar works in the State, representing \$650,000 value, with a daily capacity of 550 tons, and a daily output of 150,000 pounds of sugar. Over 5,000 acres are devoted to the crop, and the sugar per cent is large. The county yield of all vegetables is large.

Bees.—Extensive apiaries produce yearly 380,000 pounds of honey.

Horticulture.—Fruit raising is the leading industry of this county, and especially citrus fruits, in the production of which San Bernardino stands far above all other counties. "Riverside Navels" have a world-wide reputation. The acreage in fruit reported by the State Board of Horticulture is 49,236, of which 37,240 acres are in oranges and lemons (mainly the former), and 9,076 acres in vineyards, the balance being in deciduous fruits. As Fresno is known for its raisins, so has Riverside oranges spread the fame of San Bernardino. The assessed valuation of the fruit lands of the county is \$23,238,672. Next in importance to citrus fruits follow grapes, peaches, apricots, prunes, pears, olives, figs, walnuts, and almonds. The orange industry is only in its infancy, however, for only one sixth of the trees planted are yet in bearing. The plantings for 1892 were, oranges, 5,000 acres; lemons, 750; vineyard, 2,269; olives, 500. Riverside leads in oranges, with 8,688 acres; Ontario, 3,582; Redlands, 3,399; Rialto, 1,357; Highlands, 1,187; San Bernardino, 1,085; Mission, 1,859; South Riverside, 1,555; Colton, 637. The orange and lemon shipments for the county in 1892 were 1,766 carloads, or 427,242 boxes. The estimate for 1893 is 2,779 carloads, or 797,750 boxes, worth from \$1 to \$3 per box. Other varieties of fruits are apples, quinces, nectarines, loquats, guavas, strawberries, raspberries, etc. Olives are steadily gaining in favor. Deciduous fruits produced in 1892: green, 6,408,444 pounds; dried, 3,103,630 pounds; canned, 1,062,740 pounds; raisins, 5,912,000 pounds; nuts, 123,780 pounds. Raisins rank next to oranges. The Cucamonga and San Bernardino wineries make about 300,000 gallons of wine and 10,000 gallons of brandy yearly.

Stock, etc.—The stock interests of the county are of considerable importance. A number of bands of sheep are kept, and the annual wool clip is about 360,000 pounds.

The Assessor reports 6,985 horses, 12,551 cattle, 376 hogs, 390 mules, 27,320 sheep, 1,292 goats, and 1,779 dozen poultry.

Timber.—On the mountains north of San Bernardino City are about 270 square miles of heavy forests of magnificent sugar and yellow pine, fir, and spruce. Several large mills are located there, and the annual output is about 7,400,000 feet of lumber.

Minerals.—The mineral deposits of the county are varied and immense. Gold, silver, iron, lead, copper, tin, salt, borax, plumbago, soda, gypsum, asbestos, coal, and bitumen are found, mostly in the San Bernardino Mountains, and in the great broken areas of the Mojave Desert. Mining for the precious metals is extensive, but the output cannot be ascertained. Slover Mountain, near Colton, is a nearly solid body of marble and onyx. It is used extensively throughout the State. The marble columns of the California State Building at the Columbian Exposition came from these quarries. Great interest is felt in the Vanderbilt mining district, recently developed in the extreme eastern part of the county, and unusually rich results are expected from that section. A railroad is in course of construction from Goffs, on the Atlantic and Pacific, to reach that section, and to extend into the State of Nevada. A new line is also reported as in contemplation from Mojave to Independence, Inyo County, which will, when built, open up a large and rich mining territory.

SAN DIEGO.

San Diego County is bounded north by Orange and San Bernardino Counties, east by Arizona, south by Mexico, or Lower California, and west by the Pacific Ocean. It is next in size to San Bernardino County.

Statistics.—Area, 14,968 square miles, or 9,579,520 acres. Unentered Government land, 6,822,621 acres. Lands assessed, 1,569,185.67 acres. Total assessed valuation of all property, \$29,162,808. Rate of taxation, State and county, 1.42. Number of miles of railroad, 414; assessed at \$2,495,488. County property, \$185,500. County debt, \$269,000. Number of schools, 229. School children between 5 and 17 years, 8,512. School money, \$229,899 69. Population, census of 1890, 34,878.

County Seat and Principal Towns.—San Diego City, the county seat, occupies a beautiful site on one of the finest bays in the world, which has an area of 22 square miles. Population (1890), 16,159. The new city, although founded in 1867, has been practically created within eight years. There are 250 miles of street, 40 of which are graded and 5 paved; 37 miles of street railway, mostly electric; 75 miles of motor road, 41 miles of sewer, and 65 miles of water mains. There are fifteen hotels, twenty-three churches, five banks, eight large public schools, a \$100,000 opera house, \$200,000 Court-house, and numerous handsome brick blocks. A large shipping business is done, especially in imports of coal and lumber. There are coal bunkers with a capacity of 15,000 tons. Across the bay from San Diego, on a peninsula, is the famous Coronado Hotel. This hotel, with accommodations for 2,000 guests, with 7½ acres of grounds beautifully adorned with gardens, lawns, baths, terraces, ocean beach, drives, electric lights, water-works, and an entire town tributary to it, constitutes one of the most delightful seaside resorts in the world.

National City, population (1890) 1,353, is 5 miles south of San Diego; it is the terminus of the Santa Fe system on the Pacific Coast. Farther south is Chula Vista, where are extensive lemon orchards. Tia Juana, on the frontier, is the gateway to Mexico. Other places in the bay region are Otay, Oneonta, South San Diego, and Pacific Beach. Between the bay and the mountains are the fertile Sweetwater and Cajon Valleys, where large quantities of raisins are cured. Poway is in a beautiful valley, 15 miles north of San Diego, with church, school, etc. Forty miles northeast of San Diego, at an elevation of 4,250 feet, is Julian, population (1890) 327, a timbered mineral region, with productive mines and profitable apple and cherry orchards. La Mesa, 8 miles northeast of San Diego, has about 500 acres in fruit. Escondido, one of the most thriving towns in the county, population (1890) 541, is on a branch line from Oceanside. Up the coast from San Diego is a pleasant ride by rail. At Linda Vista, 15 miles north, a complete irrigation system is being established. Del Mar is a pleasant little seaside resort. Back of Encinitas is a fertile farming country. Carlsbad has a mineral spring and a comfortable hotel. Oceanside is a thriving town, with a fine beach, flouring mill, hotels, stores,

etc. The surrounding country is fertile. Five miles northeast is the San Luis Rey Valley and the old Mission, about to be restored.

Fallbrook, on an elevated rolling mesa, has a bank, churches, etc., and a fine climate. From Temecula, the southern terminus of the railroad from Perris, much produce is shipped. Murietta, population (1890) 537, has a hotel, churches, large schools, stores, and many neat homes. At Wildomar a 300-foot tunnel has developed a stream of water. Elsinore is by the side of a lake, 5 miles by 2 in extent. There is a bank, brick blocks, and a pottery. Perris, in one of the largest valleys of Southern California, now chiefly devoted to grain, is a thriving little town. There are brick blocks, a bank, hotels, irrigation system, schools, and churches. Near by are good mines. In the San Jacinto Valley, which contains an immense area of level fertile land, from 1,400 to 1,800 feet above the sea, and surrounded by mountains, is San Jacinto, population (1890) 1,200, with brick buildings, sash and door factory, planing mill, bank, hotels, etc. In the mountains are lumber mills and the Hemet Valley reservoir. Winchester is a small town between San Jacinto and Perris. At Palm Springs, on the Colorado Desert, early fruits are raised.

Topography.—San Diego is the most southern county in the State, being bounded by Mexico on the south. It is the second county in California in point of size; only exceeded in that respect by San Bernardino. A large area is desert, so called, but which only needs water for irrigation to be productive. The county extends back from the ocean to the Colorado River, and in elevation from 250 feet below to 10,987 feet above sea-level. Within these limits may be found almost every variety of soil and climate. There are three distinct belts, beginning at the coast and extending back into the desert region. From the coast-line, 75 miles in length, back to the hill country, a distance of 30 or 40 miles, are low valleys, with intervening mesas and hills. The second division includes the mountain region of the interior, where minerals are found and deciduous fruits raised. The third section is the desert, which covers about two thirds of the area of the county. This region has great possibilities, under irrigation. Recently, San Diego has entered upon a course of improvement and enterprise, proving that she does not rely altogether upon the advantages of her fine bay and peerless climate.

Soils.—The mesa lands, for the most part, have a reddish and very fertile soil. Near National City is a red clayey soil. El Cajon has loams resembling Riverside lands. Otay district is largely black adobe, very strong. Jamul and Janal are divided between black and gray adobe and sandy loam. San Jacinto Valley and plain has warm sandy loam, sometimes with clay admixtures, and turning reddish as it rises to the foothills. Colorado River bottoms, in the east, have a soil easily worked, which will be proved highly productive when the immense Colorado River irrigation system, now already inaugurated, is fully completed.

Climate.—San Diegans are justly proud of the equable and delightful climate of the coast region of the county. At San Diego, during twenty years, of the 7,304 days 5,768 were clear or fair, and there were only 847 days in which rain fell. During seventeen years, out of the 6,205 days there were only 199 when the temperature rose above 80° and only 3 when it fell to 32°. Farther inland the summer climate becomes warmer. On the desert it is very hot during the greater part of the year. In the higher mountain regions the climate is bracing, with some snow in winter, and a heavy rainfall. The average annual rainfall at San Diego City is 10 inches.

Irrigation.—As above mentioned, water development has commenced in earnest during the past few years. There are nine irrigation districts in the county, some of them of great extent, their total capacity being 250,000 acres. The Sweetwater dam, built of masonry, has a capacity of 6,000,000,000 gallons. The Hemet dam, in San Jacinto Valley, is 110 feet high, and the reservoir 2 miles long. An enterprise is now under way for the irrigation of a large section of the Colorado Desert, with water from the Colorado River. There are a number of artesian wells near San Jacinto.

Agriculture.—Cereals are largely produced in this county. In 1892 were seeded: wheat, 24,276 acres; oats, 2,737; barley, 48,719; corn, 2,225; hay, 25,647. Vegetables can be raised the year round. Tomatoes grow all winter. There are no figures at hand to show the complete agricultural products. All of the county back of the coast table lands up to 5,000 feet has for many years produced large crops of cereals and hay.

A large project is on foot for reclaiming much of the desert land of the eastern portion of the county. The Southern Pacific Railroad Company has sold about 500,000 acres,

including the noted Salton Lake, to a company of New York, Chicago, and Denver capitalists, who have this purpose in view.

Horticulture.—All fruits can be grown in this county—oranges, lemons, limes, pine-apples, bananas, guavas, and most tropical fruits, and all the deciduous fruits of the temperate zone. In San Diego Bay region, alone, there are 150,000 acres of practically frostless lemon land. In the higher altitudes apples are grown, where also pears, plums, and cherries do well. In the lower mesas and valleys all the above mentioned tropical, sub-tropical, and deciduous fruits thrive. Among them may be named the cassava, India rubber, camphor, and guava. Apples are grown near Julian, 3 miles from the summit of the great mountain divide. On the Colorado Desert figs and grapes ripen in May. Cajon Valley, last year, produced 2,600,000 pounds of raisins from 3,000 acres of vineyard, mostly young vines, yielding a revenue of \$100,000. This is also a famous lemon and orange district. There are five large packing houses and several small ones here. Olive oil of the finest quality is made at National City. Paradise Valley, on National ranch, is famous for its citrus fruits. San Diego produces more guavas than any other county in the State. There are in the county 15,782 acres of fruit trees and vines, of which 12,795 are bearing and 2,987 not bearing. There are 5,000 acres of grapes. Raisins of the finest quality are made. In 1892 there were shipped 4,636 tons of raisins and over 100 carloads of oranges, besides large quantities of green, dried, and canned fruits, and nuts.

Stock Raising, etc.—A large number of horses, cattle, and sheep are raised in the upper altitudes, where grasses, water, and shade are abundant and the cereal products large. The Assessor reports 11,590 horses, 34,639 cattle, 3,349 hogs, 573 mules, 33,777 sheep, 3,055 goats, and 2,379 dozen poultry.

Bees.—The honey product of this county is famous, the bees having a wide, natural range. The annual export is very large, amounting to 500 tons in 1892. This county leads any other in the United States in honey.

Minerals.—In the mountain regions there is much mineral wealth, the development of which has scarcely commenced, although a number of mines have been producing for many years. There are three distinct gold and silver regions—the Julian, Cargo Muchacho, and Pinacate. Within the boundaries of the county are found gold, silver, tin, copper, lead, coal, gypsum, asbestos, mica, ochre, salt, alum, borax, limestone, pottery clay, iron, quicksilver, and sulphur. There are many mineral springs.

Timber.—There are extensive tracts of timber in the higher mountain regions, chiefly pine, also fir, oak, and cedar. The most important timber section is near San Jacinto, where there are nearly 250 square miles of forest and several saw mills.

Transportation.—The Southern California Railway, of the Santa Fe system, extends through the entire length of the county, to San Diego City and National City, with branches to San Jacinto and Temecula. The northern end of the county is crossed by the Southern Pacific. There is also a branch of the Southern California to Escondido, and several short independent lines in the bay region. It is expected that a direct line from San Diego to Yuma and Phoenix, in Arizona, will soon be constructed. The Pacific Coast and Pacific Mail steamships call regularly at San Diego.

SAN FRANCISCO.

San Francisco County possesses little territory outside the city limits. It is bounded north by the Golden Gate, the entrance to the finest bay and harbor in the world, which separates it from Marin County; east by the bay of San Francisco, south by San Mateo County, and west by the Pacific Ocean.

Statistics.—Area, 42 square miles, or 27,000 acres. Lands assessed, 27,000 acres. Total assessed valuation of all property, \$412,158,906. Rates of taxation, city and county, 1.00; State, .434; total, 1.434. Number of miles of railroad, 9.82; assessed at \$111,830. City and county property, \$24,750,000. City and county debt, \$1,120,000. Number of schools, 81. School children between 5 and 17 years, 63,933. School money, \$1,243,334 38. Population, census of 1890, 297,990.

Topography.—San Francisco occupies the northern part of a peninsula lying south of the Golden Gate, and forming, together with the opposite northern peninsula of Marin County, the narrow land barrier between San Francisco Bay and the Pacific Ocean. Between the two peninsulas lies the channel connecting bay and ocean, called

the "Golden Gate," which for more than fifty years has furnished water way for the freighted argosies of all nations. The northern part of this peninsula, which is about 30 miles long and 15 miles broad on the average, is occupied by the City of San Francisco. Originally it consisted of wind-swept hills, the shifting sands of which seemed to defy either stability or cultivation. Now, these hills, graded by pick and shovel, are gridironed by streets and railways, and crowned with magnificent buildings of a populous city, or transformed by the magic of water and patient tillage into miles of verdant park, dotted with miniature lakes, ribboned with graveled drives, crowded with grottos, statuary, conservatories, and ornamental buildings, enriched with luxuriant shrubbery and brilliant flowers; the wonder of the tourist and a delight to her contented people.

The bay extends 25 miles north and 40 miles south of the city, with an average width of 8 miles, and a continuous shore-line of 300 miles. Alcatraz Island stands just inside, commanding "Golden Gate," Goat Island, between the city and the Oakland shore, and Angel Island, off the point of the northern peninsula, about 7 miles above the city. The harbor has a magnificent entrance, and there is way and anchorage inside for the commerce of the world, with deep water for the largest vessels northward through San Pablo and Suisun Bays into the Sacramento River for 50 miles above the city. Steamers, ferries, ships, and sail vessels run inside these limits across to San Rafael, San Quentin, Sausalito, and Oakland up to Port Costa, where ship and rail unite for heavy traffic; to Mare Island, the location of the Government Navy Yard; to Vallejo, Benicia, Napa, Martinez, Antioch; up the Sacramento and San Joaquin Rivers to Sacramento and Stockton. Southward lighter draught vessels reach all points of the shore-line.

Climate.—San Francisco is an eminently healthy city. It is not recommended for a pale-cheeked and a weak-lunged people. It is the proper home of active, vigorous, stirring, energetic business men, for rosy-cheeked women of rounded form and elastic step, and for healthful, robust children. The climate is uniform. Extremes of heat and cold are unknown. The mean temperature of July is 59°, and of January 50°. To people confined during summer to the heated interior valleys of the State, the tonic effect of a few days' visit to San Francisco is indescribable. Tender plants thrive the year round in the open air, and outside the business sections all the better dwellings are surrounded with a perennial growth of lawn, shrubbery, and flowers. The trade winds blow steadily during June, July, and August, and during summer fogs often drift in early in the evening and remain over night. Winter season is the most agreeable.

Commerce.—The tide of commerce has always poured a stream of wealth into the laps of the cities by the sea. San Francisco, by virtue of its climate, site, rich back-country, and harbor scope and security, is naturally better equipped for a commercial center than any city of the world. The beginnings of its commerce were accidentally due to the discovery of gold, the first intelligence of which was brought from the interior in the spring of 1848. Since then, with few pauses, and fewer periods of depression, she has steadily and rapidly pressed on to her present flattering condition. The trade of the western coast from Chile to Alaska is her natural heritage, and she can justly claim a fair, large share from China, Japan, India, Australia, and the islands of the sea.

The following tables are compiled from different sources, mainly from the 43d annual report of the San Francisco Chamber of Commerce, and the "Journal of Commerce," and give some idea of the foreign and extra-State trade of the city:

DEEP-WATER VESSELS.	ENTRANCES—1892.				CLEARANCES—1892.			
	Sail Vessels.		Steam Vessels.		Sail Vessels.		Steam Vessels.	
	No.	Ton- nage.	No.	Ton- nage.	No.	Ton- nage.	No.	Ton- nage.
Foreign -----	627	670,409	309	483,321	585	639,339	309	493,540
Domestic (Eastern) ----	57	106,418	3	5,190	30	52,991	3	4,875
Totals -----	684	776,827	312	488,511	615	692,330	312	498,415

Total sail vessels, 1,299; tonnage, 1,469,157. Total steam vessels, 624; tonnage, 986,926. Total all vessels, 1,923; tonnage, 2,456,083.

Exports of Merchandise by Sea—1892.

Foreign countries	\$31,697,903
New York, etc.	8,548,705
Total	\$40,246,608

The exports include the following articles: Wheat, \$16,332,225; flour, \$4,918,597; barley, \$1,400,000; dried, canned, and green fruits, \$2,119,000; wine and brandy, \$2,526,768; salmon, \$3,490,877; wool, \$767,740; lumber, \$600,000; and other miscellaneous items amounting to \$8,091,401. The following countries are represented: Great Britain, China, Hawaiian Islands, Mexico, British Columbia, France, Belgium, Central America, Australia, New Zealand, Japan, Panama, South America, Germany, Asiatic Russia, East Indies, Pacific Islands, etc.

Exports of Treasure to Foreign Countries for 1892.

Silver coin and bullion.....	\$13,699,153
Gold coin and gold dust.....	876,635
Currency and unspecified	790
Total	\$14,576,578

Overland exports of treasure for 1892, \$5,273,804. Combined exports of treasure and merchandise for 1892, exclusive of merchandise by rail, \$60,096,990. Merchandise exports by rail, so far as known, total pounds, 367,486,000. Accounted for in value, 324,878,939 pounds, or \$24,160,447, including the following articles: Green, canned, and dried fruits, nuts and raisins, \$2,673,640; wine, \$2,680,132; brandy, \$873,465; salmon, \$800,000; wool, \$3,730,690; hops, \$130,620; sugar, \$7,000,000; tea, \$3,371,300; coffee, \$936,600; beans, \$956,000; quicksilver, \$855,000; honey, \$95,000; rice, \$58,000. Other articles of merchandise exported by rail, for which no figures are accessible, include hides and leather, whalebone and oil, powder, fuse, glue, malt, sulphur, borax, syrup, furs, silks, vegetables, etc., and treasure not included in Chamber of Commerce reports, representing a total of about \$22,000,000. Total exports, foreign and domestic, about \$106,257,437. Distributed to the interior trade, \$20,000,000.

Imports for 1892.

By sea from foreign countries, merchandise.....	\$42,701,005
By rail from foreign countries, merchandise	2,906,945
Total	\$45,607,950
Foreign treasure by sea	8,990,386
Total foreign imports.....	\$54,598,336

The merchandise imported includes sugar, \$12,000,000; coffee, \$2,815,000; coal, \$5,136,000; rice, \$825,000; tea, \$1,300,000; and a large number of miscellaneous articles, aggregating \$22,531,950.

Receipts of domestic merchandise for 1892 approximate as follows:

Overland rail.....	\$18,500,000
Steam and clipper, Oregon and coast	15,000,000
California products received from the interior, including cereals, fruits, lumber, wool, raisins, wine, brandy, coal, salmon, potatoes, dairy products, etc.....	35,000,000
Total receipts of domestic merchandise.....	\$68,500,000

Summary.

Exports, foreign	\$60,096,990
Exports, Eastern, by rail.....	46,160,447
Distributed to interior points	20,000,000
Total shipments	\$126,257,437
Imports, foreign	\$54,598,336
Imports, Eastern.....	18,500,000
Imports, steam and clipper, Oregon and coast	15,000,000
Imports, California products from interior.....	35,000,000
Total receipts	\$123,098,336
Total shipments	126,257,437
Total commerce.....	\$249,355,773

Manufactures.—According to the report of the Assessor for 1892, San Francisco has 1,409 manufacturing establishments, with 29,399 employés, which turned out a product for 1892 valued at \$80,676,800.

Banks, etc.—The banking institutions of San Francisco January 1, 1893, are: 10 savings banks, with resources of \$115,932,245; 15 commercial banks, with resources of \$74,642,671; 2 national banks, with resources of \$9,457,183; total bank resources, \$200,032,099. Bank clearings for 1892, \$815,368,724. There are 56 mutual associations, in which the payments by members amount to \$1,500,000 annually.

Miscellaneous Items.—Mint coinage, 1892, \$23,310,604. Internal revenue collections, 1892, \$1,818,351. Customs receipts, 1892, \$7,822,046. Real estate sales, 1892, \$20,518,955. Mortgages made, 1892, \$16,060,918. Mortgages released, 1892, \$10,315,614. Dividends paid by 64 incorporations, 1892, \$7,831,162. San Francisco is the second whaling port of the world; whaling catch of her fleet for 1892, \$1,250,000. Passenger travel for 1892 by rail and steamship was, arrivals, 100,000; departures, 70,000.

Chamber of Commerce.—The Chamber of Commerce was organized in 1851, and has always been actively devoted to the commercial and financial interests of the city. It has a membership of 307, which embraces the leading business men of San Francisco. Its forty-third annual report is a mine of commercial information.

Insurance.—The Insurance Commissioner's report shows the following business of San Francisco companies and agencies for 1892: Fire insurance—written, \$378,529,166; premiums, \$6,669,998 72; losses paid, \$2,408,156 05. Marine insurance—written, \$163,305,218; premiums, \$1,927,088 44; losses paid, \$736,735 18.

Public Buildings.—The City Hall, fronting 550 feet on Larkin Street, 700 on McAllister Street, and 860 on Park Avenue, is one of the largest and costliest buildings in the country. It is 96 feet high, and when completed will be surmounted by a tower 450 feet high. The cost is about \$6,000,000. The United States Mint is the largest in the United States, with 217 feet on Fifth Street, and 161 feet on Mission Street. It is in the Doric style, and is built of freestone and California granite. The new Post Office will be built on the site recently purchased by the Government at Seventh and Mission, and is likely to be the handsomest public building in the city. It will doubtless cost over \$3,000,000. The Harbor Commissioners have commenced at the foot of Market Street the erection of a ferry building for passengers and freight, which will cost over \$600,000—and will accommodate all the large overland and local business concentrated at that point. There are also to be noted the Merchants' Exchange, the Academy of Sciences building, among many of like public character.

Water, Gas, and Electrical Works.—The city is supplied with water by the Spring Valley Water Company, whose storage reservoirs, located in San Mateo and Santa Clara Counties, have a joint capacity of 70,000,000,000 gallons and a water catchment area of 360 square miles, and whose system of dams, pumping works, and mains is as perfect as expense and scientific engineering can render it. The San Francisco Gaslight Company's works are located at Fifth and Howard and at North Beach. The new works at the latter place are of immense capacity and embrace all the latest improvements in manufacture, machinery, and storage. The city is also abundantly provided with incandescent and arc lights, for streets, stores, and dwellings, furnished by private corporations. Some hotels and business buildings manufacture their own electric lights.

Hotels.—No city in the Union is better provided with elegant and costly hotels. Among the most noted are the Palace, of seven stories, costing \$7,000,000; the Baldwin, Grand, Lick, Occidental, California, Russ, and many others. The city is also abundantly supplied with new, elegant, modern family hotels, accommodating all the way from fifty to three hundred boarders each, sumptuously furnished, entirely distinct from the commercial hotels, and affording to people of means all the advantages of home life. In the city are 116 hotels, 260 family boarding houses, 350 restaurants, and 600 lodging houses.

Theaters.—San Francisco has her full quota of theaters, prominent among which are the Baldwin, California, Stockwell's, Alcazar, Tivoli, Bush Street, Grand Opera House, Bijou, and Orpheum.

Clubs.—There are 69 clubs, athletic, social, literary, political, etc., many of them having elegant buildings and apartments, among which may be mentioned the Olympic Club, with its new building on Post between Mason and Taylor, the Pacific, San Francisco and Corinthian Yacht Clubs, the Bohemian, Pacific Union, Cosmos, Concordia,

Press Club, University, Country, Merchants, Yale, Loring, Cercle Français, San Francisco Verein, California Pioneers, etc.

Fraternal Societies.—The city, which is most favorable ground for fraternal organizations, contains at the present time Masons, with 16 lodges, 2 chapters, 1 council, and 2 commanderies; Odd Fellows, 43 lodges; Knights of Pythias, 22 lodges; Knights of Honor, 23 lodges; Improved Order of Red Men, 13 tribes; Independent Order of Red Men, 9 organizations; Order of Herman's Sons, 10 lodges; A. O. U. W., 26 lodges; American Legion of Honor, 13 councils; Ancient Order of Foresters, 28 courts; Companions of the Forest, 12 circles; Ancient Order of Foresters of America, 34 courts and 17 Companions of the Forest; Order of Chosen Friends, 26 lodges; Ancient Order of Druids, 18 branches; B'nai B'rith, 10 lodges; Order of Keshar Shel Barzel, 4 lodges, etc. There are besides these numerous other benevolent and fraternal organizations with various aims and large membership.

Churches.—The city contains 114 church organizations, all provided with houses of worship, many of them of elegant design and magnificent proportions. The Jesuit Society of St. Ignatius has the largest and most expensive church edifice in the city. Its spires are 275 feet high, and its church hall will accommodate 6,000 people. Associated with and controlled by the churches, as well as operated independent of them, are many benevolent and charitable societies and organizations, which accomplish an immense amount of good among the destitute and needy. These include such practical charities as cheap boarding and lodging houses and restaurants for men and women, homes for girls and aged women, hospitals, orphan asylums, and many other provisions for the poor.

Schools.—There are 81 public schools in San Francisco. The school property is worth \$4,932,754. There are 46,172 scholars, and the annual expenditure is \$1,098,838. Highest monthly salary paid, \$250; lowest, \$50. There are also about 100 private schools, academies, seminaries, business colleges, etc. No city in the Union is better provided with educational institutions, or contributes to their support with more princely generosity.

Kindergartens.—The following kindergartens are carried on: The First Congregational; Pioneer, 4; Silver Street, 3; Golden Gate Association, 35; and have trained 14,346 children, and contributed \$400,000, including endowments. Commercial organizations support 5 kindergartens, viz.: Produce Exchange, insurance companies, merchants, attorneys, and real estate agents. Here the children are taught thrift, economy, industry, and hygiene. Sixty-five thousand reports have been scattered; letters are received from all parts of the world, and the good work accomplished is a credit to the city, and of no insignificant contribution to its own material prosperity.

Bureaus of Mines, Sciences, Art, and Horticulture.—Among educational institutions, or largely contributory thereto, may be mentioned the Young Men's Christian Association; the Academy of Sciences, free to the public, with its choice collections in mineralogy, conchology, and zoology; the State Mining Bureau, with 10,000 specimens of ores, minerals, antiquarian relics, collection of California birds, and other curiosities; and the San Francisco Art Association, devoted to painting, sculpture, and kindred arts. The California State Board of Trade, sustained by business men of San Francisco in conjunction with outside counties of the State, maintains a permanent free exhibit, open to the public, of all the fruits, nuts, cereals, and other products of California soil, and furnishes free information to all seekers after knowledge about the State and its topography, soils, climate, and products.

Libraries.—There are 9 public libraries. The Free Library, in the City Hall, contains 75,000 volumes; the Mercantile Library, on Van Ness Avenue, about 60,000; the Law Library, in the City Hall, 28,000; the Odd Fellows' Library, 41,000; Mechanics' Institute Library, 35,000, besides maintaining an annual exhibition in its large Fair building, etc. One private library, the Sutro, contains 85,000 volumes.

Newspapers and Periodicals.—No State in the Union has so many newspapers in proportion to its population, and San Francisco is most liberally endowed. There are 15 dailies, among them the Chronicle, Examiner, Call, Bulletin, Post, and Report, most widely known, and whose joint influence has been constantly exerted and widely felt in urging the development and advertising the resources of the State. Besides these there are 19 monthly publications, and 164 weeklies and semi-weeklies. There are also 3

agricultural and horticultural weekly papers. Some of the magazines and weeklies have a wide circulation in the East and in Europe.

Transportation.—In the matter of street railways, no city in the Union is so well provided for. There are 92 miles of cable road in operation, radiating from the foot of Market Street to every part of the city, and to the Cliff House, Sutro Heights, the Golden Gate Park, Presidio, the General Railway Offices at Fourth and Townsend, and along all the leading streets of the city. Several electric roads are also in operation, one of which is extended to South San Francisco, and will press on southward into San Mateo County.

Fire Department.—The efficiency of the San Francisco Fire Department is well known. The present force consists of 320 officers, 17 steamers, 19 hose reels, 8 hose carriages, 7 hook and ladder trucks, 72 horses, 28,000 feet of hose, 1,392 hydrants, and 55 cisterns. The Fire Alarm Telegraph Department has 200 automatic signal boxes and 160 miles of wire.

New Business Blocks.—Among the new business buildings of San Francisco may be mentioned the Chronicle, Crocker, Mills, and New York Mutual Life Insurance buildings, ten and eleven stories high, built with steel skeleton and hollow tile arches, and adorned with granite, marble, onyx, pressed brick, and terra cotta, proving that California quarries are rich in the best building materials. The Pacific Mutual Insurance Company has built a splendid building of granite and pressed brick, with high ornamentation and interior finish. The Hibernia one-story bank building, constructed of white granite, with Corinthian columns, and in purely classic style, is one of the most elegant bank structures in the country. Many other fine buildings have been completed the past year, or are now in course of construction, all abundantly demonstrating that this isolated Western metropolis is not willing to lag behind her Eastern sisters in the expense lavished on her buildings or in the style of her architecture.

Government Reservations, etc.—The Presidio overlooks the bay and harbor entrance about 58 feet above the sea. The area of the reservation is 1,382.22 acres. It is beautifully laid out and planted with 350,000 trees, and contains a national cemetery. Powerful and complete modern defensive works, covering the harbor approaches, are now in course of construction, to replace the older inefficient works.

Fort Mason, called "Black Point," contains about 55 acres, the highest point about 125 feet elevation. It is an artillery post, garrisoned by one battery, the armament consisting of seacoast guns and a "plant" for torpedo defense. This post, from its site and view, is one of the most attractive in the country.

Alcatraz Island, commanding the Golden Gate, and Angel Island, lying about 7 miles northeast of the city, are also Government properties, garrisoned by artillery. Angel Island has 10 acres set apart to the Treasury Department as a quarantine station.

General Railroad Offices.—The Southern Pacific's general offices are located at their large building, corner Fourth and Townsend Streets, from which center are operated all the complicated interests and business affairs of their great railway system. The building is a complete city by itself, and a hive of industry.

Public Parks.—There are about 30 public parks and ornamented plazas in the city. The largest of these, and the pride of San Franciscans, is Golden Gate Park. It covers an area of over 1,000 acres. All cable and electric cars run here from all parts of the city for a 5-cent fare. Not much inferior to this and easily accessible from it and from the city is Sutro Heights and the Cliff House, with its Seal Rock. Immense sums have been spent here by a private citizen, but the grounds are freely open to the public, and constitute the daily delight of thousands. Here are in course of erection the finest bath houses and natatorium in the United States, close upon the ocean surf, fed with fresh water by the rise of every tide, roofed in with glass, and brilliant with a thousand colored lights.

With all its extended business advantages, its broad religious and educational provisions, its unparalleled climate and magnificent natural scenery, its cheap and rapid transportation, its abundant facilities for amusement and recreation, its most varied and low-priced food markets and cheap homes, and its profuse supply of all the luxuries, as well as the economical comforts of living, San Francisco presents attractions for the capitalist, the tourist, the business man, and the home-seeker not to be found elsewhere in the world.

SAN JOAQUIN.

San Joaquin County is bounded on the north by Sacramento, east by Amador, Calaveras, and Stanislaus, south by Stanislaus, and west by Alameda and Contra Costa Counties.

Statistics.—Area, 1,370 square miles, or 876,800 acres. Lands assessed, 868,406.62 acres. Total assessed valuation of all property, \$39,929,385. Rate of taxation, State and county, 1.05. Number of miles of railroad, 138.66; assessed at \$1,717,923. County property, \$712,000. County debt, \$235,000. Number of schools, 132. School children between 5 and 17 years, 6,865. School money, \$162,138 20. Population, census of 1890, 28,576.

County Seat and Principal Towns.—Stockton, the county seat, population between 18,000 and 20,000, is situated on a navigable channel which joins the San Joaquin River three miles from the city. It is the natural entrepot of the San Joaquin Valley, the seventh city in population in the State, and very important in manufacturing industries, as the following report of the output in 1892 shows: Flour mills (4), \$7,850,000; agricultural implement factories (6), \$1,500,000; planing mills (4), \$669,625; foundries (4), \$207,000; carriage factories (3), \$190,000; wine and brandy, \$262,000; furniture, \$60,000; terra cotta and brick, \$91,000; soda water, \$90,000; woolen mills, \$350,000; tannery, \$390,000; paper mills, \$330,000; windmills, \$100,000; all other factories, \$595,000; total, \$12,714,625. These factories employed 1,599 men, and paid \$1,251,233 for wages; average per workman, \$782 50, or over \$65 a month. The flour mills have a capacity of 9,000 barrels daily. Stockton has fifteen natural gas wells, yielding from 25,000 to 100,000 cubic feet each daily. This gas is extensively used for both light and heat. It is found from 800 to 1,200 feet below the surface. Its transportation facilities are abundant; 22 steamers and 20 barges are constantly plying the rivers between Stockton, San Francisco, and interior points, two lines running daily between Stockton and San Francisco. They carried in 1892 over 50,000 passengers and 650,000 tons of freight. It is also connected by the branches of the Southern Pacific with Sacramento, San Francisco by two routes, all points in the San Joaquin Valley, with Oakdale, and Milton and Valley Springs in the foothills. It is a terminal shipping point to and from the East; 22 trains leave daily. The city is well provided with good roads, perfect sewer system, gas and electric light works, electric street railways, one of which may be extended to Lodi this season, elegant county buildings, splendid agricultural fair pavilion, a kite-shaped race track, magnificent opera house, fine public school buildings and public library of 17,000 volumes, and a bequest of \$75,000 for a new library building, five banks of large resources, two daily and five weekly newspapers, many elegant churches, an excellent water supply, a death rate of only 15.4 in 1,000, many fine hotels and business buildings, and all other features of a healthy, energetic, prosperous modern city. Among other towns of the county are Lodi, with bank, flour mill, two newspapers, the center of a large grain, fruit, and melon district; Lathrop, Banta, Ellis, Holden, Woodbridge, Peters, Ripon, Clement, New Hope, Lockeford, and Linden.

Topography and Soil.—San Joaquin County extends from the hills of the Coast Range on the southwest to the plains of the Cosumnes River on the north, and to the base of the foothills of the Sierra Nevada on the east. In the northwest, along the Sacramento and San Joaquin Rivers, are large tracts of tule land, and throughout this region are numerous immensely fertile islands, subject to overflow, and such as are reclaimed by levees are under cultivation. In the north are sandy lands, and between them and the tule lands a broad belt of black loam and adobe. The low lands forming this delta contain about 150,000 acres under cultivation. They comprise altogether one fifth of the lands of the county. From Stockton eastward to Linden, Lockeford, and Lodi is a large level tract of very fertile strong soil, somewhat adobe, excellent for cereals, vegetables, and fruits. Most of the county is level land, excepting the small foothill tract referred to. Its rivers are the Sacramento, San Joaquin, Calaveras, Mokelumne, and Stanislaus.

Climate.—The climate of Stockton is almost exactly like that of Naples in Italy. The temperature of July and August frequently passes the 100° mark, the nights being cool and refreshing. In winter the mercury sometimes drops to a little below 32°. The general climate is much moderated by the influence of ocean breezes coming up the river and bay channels. The annual rainfall is about 14.1 inches.

Irrigation.—For its magnificent crops of cereals and hay the county needs no irrigation, nor for the immense yields of vegetables and melons on the moist lower lands. To obtain the best results, however, in fruit, vineyard, berry, vegetable, and melon culture, the discrete use of water is demanded, and to meet this demand extensive systems are now inaugurated, and will soon be put into operation. The Woodbridge Canal has a capacity to supply nearly 60,000 acres. The San Jacinto Land and Water Company is constructing works to cover 300,000 acres; \$250,000 has already been expended, and the work will be completed in eighteen months. A proposition is on foot to utilize the Calaveras River to cover 80,000 acres more, and eventually it is expected that more than half the acreage of the county will be covered by the entire systems constructed. Artesian water can be found almost anywhere at about 500 feet depth.

Agriculture.—San Joaquin is one of the great grain-producing sections; 40 or 50 bushels of wheat to the acre is no unusual yield, while barley has yielded as high as 60 bushels. The average annual wheat crop is about 4,000,000 bushels. The following acreage for 1892 is reported for various crops: Wheat, 275,018; barley, 74,142; oats, 330; corn, 195; hay, 10,365. Alfalfa is a large, reliable, and valuable crop for hogs and cattle, and two to three crops grow annually without artificial watering. Many tons of vegetables are also raised in the county.

Horticulture.—Horticulture is rapidly becoming a leading industry. The total area in fruit now amounts to 5,980 acres—3,567 bearing and 2,413 not bearing. The leading varieties are indicated by the following list of trees in the county: Peach, 82,956 trees; apricot, 69,270; almond, 85,149; prune, 51,022; pear, 37,880; cherry, 11,071; fig, 11,908; olive, 8,344; apple, 7,490; orange, 5,765; walnut, 5,221. There are besides 1,880 acres of grapes. Most all of these are comparatively recent plantings. San Joaquin will soon take a front rank among the fruit-raising counties. Notwithstanding its youth in this industry, the county boasts of the largest continuous orchard in the world under one management, containing 3,200 acres, planted to nuts and fruits, citrus and deciduous. The exact figures of fruit shipments from Stockton for 1892 are not at hand, but they are known to be greatly in excess of 1891, which amounted to 650 tons. Hundreds of carloads of watermelons are shipped annually from Lodi and other points. Canneries are greatly needed in Stockton. Justice would not be done to this prosperous county without especial reference to its large and valuable product of table and wine grapes, and its output of first-class wines and brandies. The Tokay, Emperor, Cornichon, and Muscat grapes are raised and shipped East for table use, and the best varieties of grapes for the manufacture of wines; about one third of the vineyard acreage is devoted to the Muscat grape for raisins, of which product over 10,000 boxes are shipped annually, the quality being fully equal to any produced elsewhere.

Stock Raising, etc.—The conditions for stock raising in this county are of the best, and that they are extensively utilized is abundantly proved by the Assessor's report for 1892, showing, horses, 21,901; cattle, 28,622; hogs, 11,182; mules, 2,941; sheep, 41,852; poultry, 6,815 dozen. All the Assessor's figures for the State in this connection are very conservative, but they serve well to make comparison of the relative importance of the various counties in this industry.

Prices of Land.—The development of San Joaquin County has always been constant, and "boom" figures have never been placed on its fertile acres. Foothill lands, suitable for fruit, can be bought for from \$10 to \$25 an acre, while the valley lands bring all the way from \$20 to \$50, according to locality. Of course this is for lands entirely unimproved and not too near the cities of Stockton, Lodi, Acampo, and other fruit centers.

It will thus be seen that to one seeking the best of soils, a genial, winterless climate, excellent transportation facilities, the neighborhood of a large manufacturing center, association with a live business community, and enjoyment of the best educational advantages, San Joaquin County offers great inducements, and on the most reasonable terms.

SAN LUIS OBISPO.

San Luis Obispo County is bounded on the north by Monterey County, east by Kern, south by Santa Barbara, and west by the Pacific Ocean.

Statistics.—Area, 3,578 square miles, or 2,289,920 acres. Unentered Government land, 250,000 acres. Lands assessed, 1,429,680 acres. Total assessed valuation of all property,

\$15,278,939. Rate of taxation, State and county, 1.25. Number of miles of railroad, 72.70; assessed at \$513,345. County property, \$135,000. County debt, \$153,000. Number of schools, 106. School children between 5 and 17 years, 4,957. School money, \$92,651 45. Population, census of 1890, 16,176.

County Seat and Principal Towns.—San Luis Obispo, the county seat, population about 3,000, is located about 8 miles from its harbor town of Port Harford, with which it is connected by rail. It has fine county buildings, elegant and costly hotels, excellent streets, new sewer system, five churches, daily and weekly newspapers, three banks, with over \$1,000,000 deposits, flour mills, and fine substantial business blocks. Before long the gap in the Southern Pacific Railroad will be closed, which will give it the benefit of the through coast route from San Francisco to Los Angeles.

Paso Robles is also a prosperous town on the railroad line from San Francisco, in the upper Salinas Valley, and has about 1,000 population, a bank, a noted hotel, the resort of invalids and tourists, hot sulphur and mud springs, two newspapers, schools, churches, mills, and large grain warehouses. A new and extensive water system will soon be introduced by the Crystal Spring Water Company. Near by is one of the experiment stations of the United States.

Templeton has a bank, schools, churches, newspapers, grain warehouses, etc. Other important places are San Miguel, Arroyo Grande, Port Harford, and Santa Margarita, the present railroad terminus. Port Harford has regular steamer connection with San Francisco and Los Angeles.

Topography.—The county is divided into two parts by a low range of mountains, running from northwest to southeast, leaving one third on the coast and two thirds in the interior. This range gives abundant water to the county. Springs are numerous from base to summit, and many perennial streams run through deep valleys down either slope. The largest of these streams on the western slope are San Simeon, Santa Rosa, Villa, Old Creek, Morro, Chorro, Arroyo Grande, Suez, Huasna, Alamo, and Cuyama. On the northeast slope are Salinas River and branches, San Juan from the east, Santa Margarita, Atascadero, Paso Robles, San Marcos, etc. West of the Santa Lucia range of mountains is the coast region, a broad area of foothills and valleys, the latter some thirteen in number, while to the east are the larger valleys of San José, Santa Margarita, Salinas, Estrella, and others.

Soils.—The soil on the coast is deep and fertile, alternating adobe and sandy. The eastern portion is deep, rich, sandy loam, with traces of adobe, and both sections are of the best quality, even to the hilltops. In the foothills the red lands prevail, easily worked, and very productive.

Climate.—Along the coast frost is rarely seen—in many places never—yet grapes do not ripen well nor oranges grow successfully on the coast, but there is a distinct thermal belt, altitude 100 to 600 feet, east and north of San Luis Obispo, unknown to frost. The most delicious oranges grow in this belt. The interior valleys have a similar climate to the famous Salinas Valley of Monterey. The average temperature of San Luis Obispo, near the coast, varies little winter and summer, ranging from an average of 54° to an average of 62°. The interior valleys range from extremes of 32° in winter to 100° in summer, though such extremes are rare, but the average winter and average summer show much smaller differences. The average annual rainfall is 21.07 inches.

Agriculture.—All the cereal crops are grown on the uplands. Potatoes, beans, squash, cabbage, onions, tomatoes, and other vegetables are grown extensively and attain enormous size. Beans figure largely among the exports of the county. The wheat shipments along the railroad from Paso Robles, Templeton, and San Miguel are very large. The wheat of this section bears a very high reputation for fine quality and high percentage of flour. Acreage sown in 1892, wheat, 125,750; oats, 6,100; barley, 89,000; corn, 550; hay, 45,320. Alfalfa is raised in many places in the county.

Horticulture.—Much attention is now being paid to fruit culture, though the county has not yet reached a prominent rank in this respect. In the Arroyo Grande section fruits and vegetables grow in profusion and to great size. On the coast apples and pears rank best; in the interior the prune, apricot, and olive; on the hills the choicest grapes, for table, raisins, and wine, are produced. Near Templeton is a 250-acre prune orchard. Around Paso Robles much attention is now being given to fruit culture, though the orchards are yet young. Other admirable fruit sections are

the Arroyo Grande Valley, the Salinas Basin, and the San José Valley. The total acreage of fruit is 4,646, of which 3,262 are bearing and 1,384 not bearing, ranking in varieties as follows: prunes, grapes, peaches, walnuts, apples, apricots, olives, cherries, lemons, oranges, and figs. There is no limit to the possible development of this county in fruit culture, whenever enterprise pushes it and the outside markets are cheaply reached.

Stock Raising and Dairying.—The character of the county renders this interest a very profitable one. Abundant natural water and vegetation and extensive ranges prevail. The higher plateaus of the southeast are covered with grasses and devoted to stock raising. There are many large stock ranges, and dairy farms are numerous. Their annual product is over 3,500,000 pounds of butter, and 900,000 pounds of cheese, most of which is shipped to San Francisco. The Assessor reports for 1892: Horses, 13,568; cattle, 76,989; hogs, 4,418; mules, 276; sheep, 24,050; goats, 560; poultry, 3,975 dozen.

Minerals.—Quicksilver, onyx, copper, coal, chrome iron, granite, gold and silver, asphaltum, and petroleum are found in various parts of the county.

Fisheries.—The fisheries of the coast are important, and the business is capable of great increase.

Health and Pleasure Resorts.—Paso de Robles is a famous resort, with its grand hotel, baths, and springs; so also are San Luis Obispo, with its fine hotel accommodations, Santa Ysabel Springs, Newsom Warm Sulphur Springs, and other places. No better trout fishing is found in the State. The Pismo clam beach, 20 miles long, with its splendid drive, is a noted locality.

Prices of Land.—This county offers the most favorable opportunities to purchase good land in the above described valleys at very reasonable prices. When the through railroad system to Los Angeles is completed such property must greatly increase in value.

SAN MATEO.

San Mateo County is bounded on the north by San Francisco, east by San Francisco Bay and Santa Clara, south by Santa Cruz County, and west by the Pacific Ocean.

Statistics.—Area, 467 square miles, or 298,880 acres. Unentered Government land, 2,500 acres. Lands assessed, 296,197 acres. Total assessed valuation of all property, \$16,264,679. Rate of taxation, State and county, 1.15. Number of miles of railroad, 25.10; assessed at \$234,704. County property, \$55,000. County debt, \$78,000. Number of schools, 56. School children between 5 and 17 years, 2,641. School money, \$57,869 93. Population, census of 1890, 10,054.

County Seat and Principal Towns.—Redwood City, the county seat, population 1,600, is located on San Francisco Bay, and has rail communication with San Francisco. It is an active business place, with good public and business buildings, churches, and schools, and two large tanneries with a yearly output of 70,000 hides. It is provided with good light, water, and sewer systems, and excellent streets, and is a large shipping point for the products of the interior. Menlo Park, Millbrae, Fair Oaks, Belmont, etc., are the locations of elegant and luxurious suburban homes of San Francisco merchants and retired capitalists. Pescadero, Half Moon Bay, and Amesport are located on the coast, and are important shipping points for dairy and other products. Searsville, La Honda, and Woodside are among the hills. Baden is near the northern boundary, on the railroad, 2 miles from San Bruno Point, where the immense abattoirs of the San Francisco Land and Improvement Company are located, and a town of over 600 population has sprung up the past year.

Topography.—The county has 35 miles frontage on the east on San Francisco Bay, and 65 miles on the west on the ocean. A spur of the Coast Range, called the Santa Morena, divides the county north and south. The coast portion and the mountains occupy one half the area, the eastern division the other half. The mountain range averages 9 miles in width, with an altitude of about 2,500 feet. There are many fine streams on both slopes, and the county is generally well provided with water. The Spring Valley Water Company of San Francisco has its main reservoirs and sources of supply in this county.

Soils.—The soil of San Mateo is generally a warm, sandy loam, with admixture of adobe in some places. There are about 23,000 acres of salt marsh land on the bay side.

Climate.—The Santa Morena range turns aside the sea breeze, and holds back the ocean fogs, which roll up the western slope and bank themselves along the summit. The influence of the ocean breeze thus reaches the eastern portion very much tempered down, but reduces the summer heat to a delightful medium. The average summer temperature is 72°, and rarely on the coldest winter nights reaches 36°. This generally occurs between December 15th and January 15th. The rainfall is about the same as at San José.

Agriculture.—Large crops of wheat, barley, beans, potatoes, and other vegetables are raised in the region about Half Moon Bay, in the western section, and shipped by water to San Francisco. Vegetables are sent from this county to the city markets every day of the year.

Horticulture.—Many of the large ranches heretofore held are now being subdivided and sold in small tracts, which is expected to stimulate fruit raising, an industry which has not hitherto received the attention it merits. There are 432 acres of vineyard and orchard—361 bearing and 71 not bearing—the varieties ranging as follows: Apples, 149; grapes, 110; prunes, 48; apricots, 45; olives, 28; pears, 26; then cherries, almonds, walnuts, and figs. The orchards are mostly for family use, varying generally from 1½ to 2 acres. Fruits do marvelously well with proper attention. The main interest is in vegetable raising and dairying.

Stock and Dairying.—A large amount of butter and cheese is manufactured in this county for the San Francisco market, and thousands of gallons of milk are daily shipped to the city. There are a number of large dairies famous for their output, where extensive experiments have been made in the grasses best adapted to the soil, and giving the best results in milk. Most of the dairying and manufacture of butter and cheese is carried on in the coast section, and the products shipped to the city by sea. Creameries are in successful operation at Pescadero and Half Moon Bay. The Assessor's report for 1892 shows 2,778 horses, 13,337 cattle, 1,383 hogs, 109 mules, 136 sheep, 119 goats, and 2,670 dozen poultry. The immense stockyards located at Baden, or South San Francisco, will doubtless greatly increase the product of beef cattle and mutton in this convenient section.

Timber.—It is surprising to find so large a tract of virgin timber so near a large city, as exists in this county. In the extreme southwestern portion, in what is termed the Big Basin, there are estimated standing 100,000 acres of redwood of great size, rivaling, in some cases, the gigantic sequoias of the Sierra Nevada. There are five saw mills and nine shingle mills in the mountains, and their annual output is valued at \$1,000,000. Fully 65,000,000 shingles are shipped each year.

Attractions.—With its splendid country roads, to the improvement of which much money is yearly devoted, with its elegant suburban homes, and its numerous hotels for summer residence, its superior educational advantages, its genial, equable, and healthful climate, its large stretch of ocean coast and bay frontage, and its frequent and close communication with the metropolis, this county presents both to the tourist and the home-seeker many inducements. The proximity of the Stanford University adds to the value of the county as a residence for those seeking superior educational facilities.

Prices of Land.—Prices of land are, of course, comparatively high in this section, but considering these many advantages not higher than the situation justifies.

SANTA BARBARA.

Santa Barbara County is bounded north by San Luis Obispo County, east by Ventura, south by Santa Barbara channel, and west by the Pacific Ocean.

Statistics.—Area, 2,265 square miles, or 1,449,600 acres. Unentered Government land, 330,000 acres. Lands assessed, 1,118,081 acres. Total assessed valuation of all property, \$17,070,154. Rate of taxation, State and county, 1.40. Number of miles of railroad, 53.60; assessed at \$440,041. County property, \$121,500. County debt, \$6,000. Number of schools, 93. School children between 5 and 17 years, 4,525. School money, \$92,570 71. Population, census of 1890, 15,730.

County Seat and Principal Towns.—Santa Barbara, the county seat, population, census of 1890, 5,864, is a beautifully located city on the island-protected channel of the Pacific Ocean, which lies south of the coast. Its harbor is a good one. The United

States vessels built on this coast are officially tested on the course through this channel. It has connection by rail with Los Angeles on the south, and the gap now remaining to the north between Ellwood and Santa Margarita when closed will give it direct rail connection with San Francisco, and will place it on the direct tourist's route from the north to the south. Lines of first-class steamers connect also with Los Angeles, San Diego, and San Francisco. The city is well provided with hotels of the first class, gas, electric, and water works, good sewer system, street car lines, three banks, five schools, thirteen churches, opera house, race course, three newspapers, and many other attractions and conveniences. A splendid boulevard skirts the ocean front, and another extends from the wharf to the foothills. It is a city of shrubs and flowers, of groves and lawns, and elegant homes. Its almost insular and balmy climate is a perpetual delight and constitutes it one of the best resorts for invalids in the State.

Montecito is a beautiful residence place, in a sheltered nook facing the ocean, among park-like clumps of live oaks. There are lemon groves, a fine olive mill, and a luxurious semi-tropical growth of vegetation. In the extreme southeastern corner of the county is the town and valley of Carpenteria, noted for its deep alluvial soil and walnut orchards. Goleta, east of Santa Barbara, is a trading point for the dairy ranches in that neighborhood. Ellwood is on the celebrated olive ranch of that name. North of the mountains is Lompoc, which was founded as a temperance colony in 1874. The town has good churches, schools, etc. Santa Maria, in the valley of that name, which has the largest available stretch of arable land of any valley in the county, is a progressive town, the second in the county, with good school buildings, churches, water and sewer systems, banks, hotels, cannery, flouring mill, etc.; population (1890), 1,200. Guadalupe is surrounded by dairy ranches, mostly conducted by Swiss. Los Alamos is a sightly place in a fertile valley. Los Olivos is the present southern terminus of the Pacific Coast Railway. Olives and other crops are raised, also live stock. Santa Ynez, in the valley of that name, has a good hotel, stores, etc. Around Ballards fine fruit is grown.

Topography.—A large part of the northeastern portion of the county is rugged mountains, containing some few small fertile valleys. The county is divided east and west by the Santa Ynez Mountains. The northern portion, the most extensive, comprises four important valleys—Santa Maria, Lompoc, Los Alamos, and Santa Ynez. The southern part, between mountains and ocean, is called Santa Barbara Valley in general and comprises Carpenteria, Montecito, Goleta, and Ellwood. The following represents the acreage of all the foregoing and the islands: Santa Maria and adjuncts, 250,000; Los Alamos, 150,000; Lompoc, 230,000; Santa Ynez, 200,000; Santa Barbara, 108,000; two islands, 150,000.

Soils.—Santa Barbara Valley in its lower levels is alluvial, very deep and fertile, producing famous crops of lima beans, fresh berries, and vegetables the year round; the upper part, somewhat adobe, black and fertile, is devoted to cereals, mustard, flax, and pasture. The soils of the northern valleys are mostly sandy loam. On the west, near the sea, they are somewhat heavier. The Santa Maria Valley is a sandy loam, while its extension, the Sisquoc Valley, is deeper and richer. The lower and northern valley grows large crops of beans and potatoes, and higher up wheat and barley. The future of the entire section lies in its adaptability to fruits of all kinds, varied according to soil and location.

Climate.—Few places in the world can show so remarkable a record. For twenty years the mercury has only once reached 31°, and once as high as 102°. The average for thirteen years varied from 55° to 71°. There are over 310 pleasant days in a year, 5 rainy, 12 showery, 29 cloudy, and 10 windy. The strip of land along the south coast bears a striking resemblance to the Riviera. An invalid could be out all day for 346 days in the year, without discomfort. Surf bathing in midwinter is common; the temperature of the water only varies 6° summer and winter. The average annual rainfall is about 18 inches.

Agriculture.—In the line of agricultural products wheat, barley, corn, hay, beans, mustard, potatoes, and all other vegetables are largely raised. Large fields are devoted to pampas grass. Anything can be raised on this soil and in this climate. The Assessor reports 38,240 acres in wheat, 31,690 in barley, 1,328 in corn, and 15,790 in hay for 1892.

Floriculture.—This county is the florist's paradise. All varieties of flowers and shrubs are grown in the greatest profusion. The recent flower festival in Santa Barbara

was a carnival of delight, and was visited by many people from the entire State and from the East.

Horticulture.—There is the widest range of adaptability to fruit production for all varieties, the same as in San Diego. In tropical fruits, the cherimoya, mango, and alligator pear; in citrus fruits, oranges, lemons, and limes; in semi-tropical fruits, loquats, guavas, dates, bananas; in deciduous fruits of the temperate zone, the entire range, besides olives, figs, apricots, grapes, prunes, almonds, and English walnuts. The principal fruit sections are Carpenteria, Montecito, Ellwood, Livas, Santa Maria, and Lompoc. The main product is olives, in which Santa Barbara leads the State. There are over 30,000 trees, and the finest grade of oil is made, which has gained a national reputation. The annual output of one orchard is 30,000 bottles of oil. All kinds of nuts do famously. There is here the largest orchard of English walnuts in the world. The lemon industry is receiving prominent attention, and some of the finest fruit in the world is produced in this county. Many new and large lemon groves are being planted. The total acreage in trees and vines is 9,439, of which 6,243 are bearing and 3,196 not bearing, ranking as follows: walnuts, lemons, apricots, olives, figs, prunes, peaches, oranges, almonds, pears, and cherries. On Santa Cruz Island 4,500 gallons of wine were made last year. Santa Barbara needs only better railroad service and closer connection with the outside world, in a word, development, to produce the grandest results in fruit culture.

Stock Raising and Dairying.—Stock raising and dairying are carried on to a considerable extent, mainly north of the mountains and in the coast regions. The railroad shipped out of the county, in 1891, 250,000 head of live stock and 10,300,000 pounds of other products. Probably one half as much more went by sea. Stock raising was formerly the leading pursuit, but the stockman is gradually retreating before the orchardist. The wool product, however, is still very large. On the islands of Santa Cruz and Santa Rosa are about 75,000 sheep. The Assessor reports 10,619 horses, 33,206 cattle, 3,405 hogs, 956 mules, 136,982 sheep, and 4,216 dozen poultry.

Fishing.—The fisheries of the coast are very valuable, those of Santa Cruz and San Miguel being extensive. The abalone, a large mollusk, is found in abundance. The meat is dried and shipped to China and the shells are polished for ornaments. Many pearls are found in them.

Minerals.—Valuable mineral deposits are found throughout the mountain ranges; gold, silver, copper, quicksilver, manganese, gypsum, asphaltum, and bitumen abound, and Carpenteria has large plants for refining and preparing the last two products. Petroleum is found in paying quantities about 10 miles from Santa Barbara, which is piped from the mountains to Carpenteria. There are over 20 natural gas wells, and many use the gas for fuel and lighting purposes. A well on the Ortega ranch, 104 feet deep, flows 2,000,000 cubic feet per day.

Timber.—There is much valuable timber in the mountains and large detached groves, and everywhere along streams are scattering oaks for fuel.

Prices of Land.—Land prices are not high, yet it is difficult to state the exact price of land, as it varies with the situation. Near settlements and towns, and in well cultivated, rich districts, prices are much higher than those in remote sections. No county presents superior inducements for intelligent, industrious settlers with more or less means, and the retired moneyed man in search of a charming, quiet home, among refined and cultured people, need look for no better location.

SANTA CLARA.

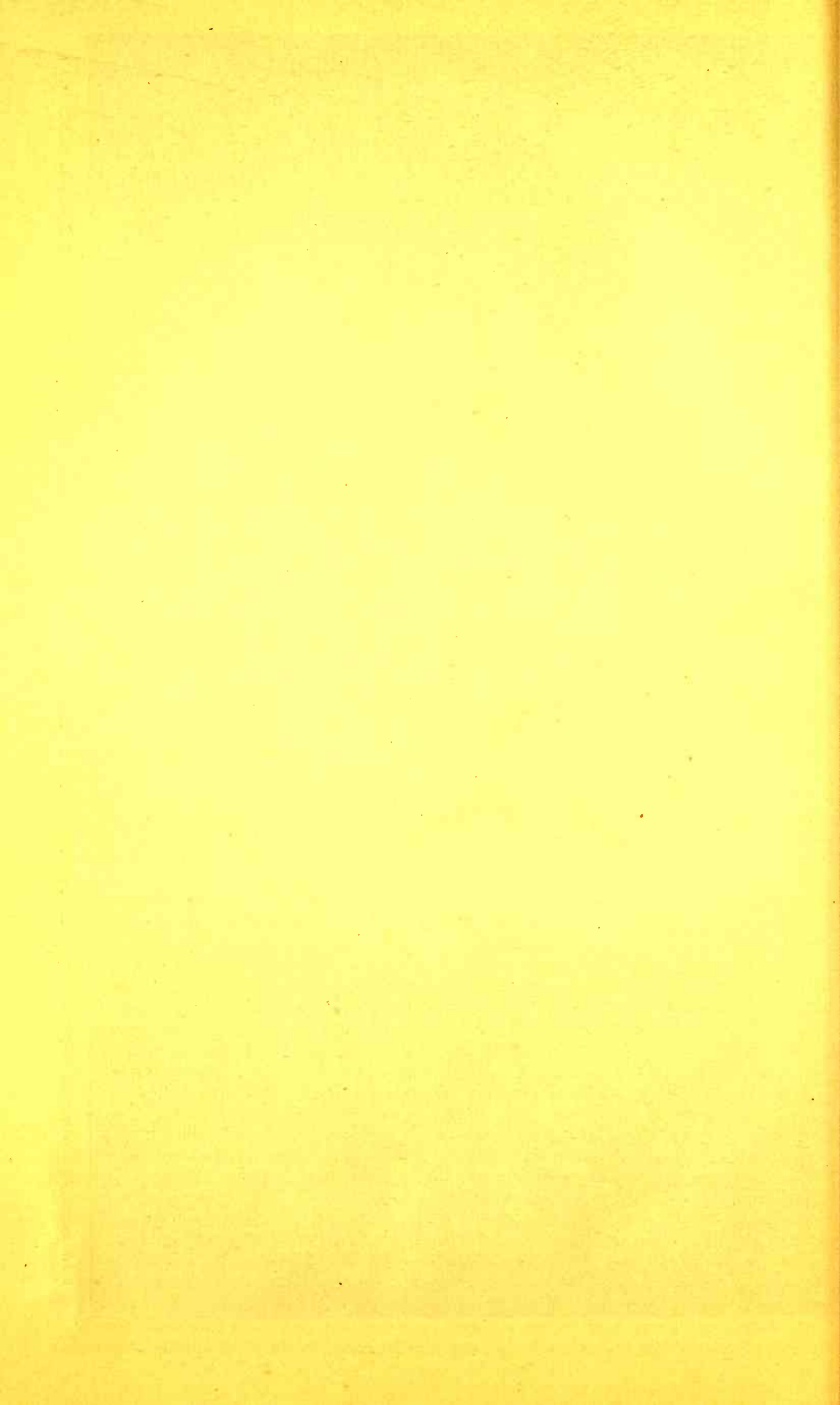
Santa Clara County is bounded on the north by Alameda, east by Stanislaus and Merced, south by San Benito, and west by San Mateo and Santa Cruz Counties.

Statistics.—Area, 1,750 square miles, or 1,120,000 acres. Unentered Government land, 50,000 acres. Lands assessed, 689,500.72 acres. Total assessed valuation of all property, \$54,812,088. Rate of taxation, State and county, 1.15. Number of miles of railroad, 112.60; assessed at \$1,276,245. County property, \$576,500. County debt, \$212,000. Number of schools, 209. School children between 5 and 17 years, 13,171. School money, \$264,785 87. Population, census of 1890, 47,895.

County Seat and Principal Towns.—San José, the county seat, has a population of about 20,000, and is situated about 50 miles from San Francisco, with which it is con-



LA MARQUE ROSEBUSH, 32 years old; trunk 44 inches in circumference; Santa Clara County. Photograph by Misses A. A. and L. E. Lewis.



nected by three lines of railroad, with twenty-two daily trains. It is one of the most charming, attractive, and wealthy cities of the State. Its Court-house, with Corinthian architecture and lofty dome, was erected at a cost of \$225,000. Its Hall of Records, just completed, cost \$160,000. It boasts also a new City Hall, 25 miles of electric road, electric light and gasworks, 108 miles of macadamized and asphaltum streets, 35 miles of brick and pipe sewerage, elegant parks, and hotels of cosmopolitan fame, six banks, four daily and four other newspapers, a free library and art school, the State Normal School, colleges, and splendid public school provision in buildings and furniture, twenty churches, with \$500,000 of property and 8,000 membership, magnificent business blocks, and every feature of a first-class city. It is well provided also with manufactories of iron, flour, beer, wines, and brandies, some of the largest fruit canneries of the State, and annually ships nearly 100,000,000 pounds of various products from her railroad depots.

Santa Clara, population 3,000, is connected with San José by street railway. It has colleges, newspapers, bank, wineries, fruit driers, etc., and ships annually over 20,000,000 pounds, mostly fruits, wines, and berries.

Gilroy, population 2,000, has a bank, two newspapers, mills, factories, and good business buildings.

Los Gatos, population 1,700, is a large fruit-producing center, with a bank, two newspapers, schools, churches, etc.

Mayfield, population 1,100, is the nearest town to Stanford University.

Other important and prosperous towns are Mountain View, Alviso, Milpitas, Berryessa, all fruit centers of importance, with canneries, etc., Saratoga, and Agnews, where the Branch State Insane Asylum is located.

Topography.—The eastern boundary of the county is the crest of the Coast Range; its western the summit of the Santa Cruz Mountains. Between is the famous Santa Clara Valley, about 30 miles wide at its northern extremity, but with an average width of 15 miles. The hills adjacent to the valley are wide and gently rolling. There are about 250,000 acres of valley and 300,000 acres of foothills. The warm belt is a tract from 600 to 2,000 feet altitude along the slope of the hills encircling the valley. It is generally, and in some cases absolutely, free from frost. In this belt east of Milpitas, potatoes, peas, tomatoes, and strawberries are grown for the San Francisco and other markets all the year. The Los Gatos and Guadalupe Rivers and Coyote Creek are the principal streams, though there are many other smaller ones—the larger ones diminishing greatly and the smaller ones disappearing entirely in the summer.

Soils.—There is a great variety in this valley. Around San José on the Guadalupe and Los Gatos Rivers are some hundreds of acres known as the "Willows," esteemed the most desirable in the valley. The soil is a sedimentary deposit easily cultivated and requiring no irrigation. In the southern portion of the valley the soil is eminently productive, and some of the most successful dairies of the State are established there. The more elevated portions are adapted to fruits and vines. Alviso district has a rich, black loam highly prized for small fruits, vegetables, seed farms, etc. The red chemisal and chaparral lands on the hillsides, though more difficult of cultivation, give good results in fruit culture. The higher lands are composed of black, tenacious, and wonderfully fertile clay loam. On the borders of San Francisco Bay are thousands of acres of salt marsh, which, wherever reclaimed, are most productive.

Climate.—The mountain range on the west shuts off the fogs and winds of the ocean, and the eastern the hotter winds of the San Joaquin Valley. The average temperature is, winter, 50°; summer, 80°. On rare occasions a higher temperature is shown in summer, and occasionally 32° is reached in winter. The average annual rainfall is from 15 inches in some localities to 35 inches in others. The climate in general is unsurpassed in the State.

Irrigation.—Irrigation is not generally practiced, but where considered necessary is effected by artesian wells and pumping. These wells are found all over the valley, varying from 60 to 100 feet deep, though a greater depth often yields a larger supply. The cities and larger towns are supplied by reservoir and complete waterworks systems. The valley is covered with windmills.

Agriculture.—Though the valley is immensely productive of all cereals and grasses, the extensive subdivision into small farms has stimulated the direction of agricultural

efforts into other channels, there being 1,368 tracts of 10 acres or less; 1,448 of 15 to 40 acres; 252 of 40 to 60 acres; 588 of 60 to 100; 563 of 100 to 160; 307 of 160 to 240; 209 of 240 to 320; 169 of 320 to 400; and 309 tracts in excess of 400 acres. That the cereal product is yielding to others, is proved by the acreage sown in 1888, of 37,910, and that of 1892, 32,558. There were 34,935 acres devoted to hay in 1892. Some of the shipments of 1892 are: garden seed, 596,010 pounds; potatoes, 4,004,040 pounds; hops, 277,945 pounds; beans, 62,150 pounds. As these shipments are by rail only, and mostly Eastern, the figures give only an approximate idea of the total output, as much more is shipped by water to local markets. More tomatoes are raised in Santa Clara County than in any other part of the State. The production of celery, asparagus, cabbage, rhubarb, beets, peas, onions, and other vegetables is almost beyond computation.

Horticulture.—But the leading business of the county is fruit raising, and especially deciduous fruits. In 1892 the rail shipments were, canned fruits, 20,711,785 pounds; green fruit, 15,656,675 pounds; dried fruit: prunes, 16,992,830 pounds; peaches, 986,210 pounds; plums, 57,140 pounds; pears, 338,600 pounds; apricots, 2,462,125 pounds; grapes and raisins, 142,335 pounds; total green, canned, and dried fruits, 57,347,700 pounds. There were also shipped 4,868,015 pounds of wine and brandy and 20,000 pounds of nuts, or a grand total of fruit products of 62,235,715 pounds.

Santa Clara leads the State in the prune production. The variety grown is mainly what is known in France as the Prune D'Agen, but here called the California prune. The prune in this section grows in equal luxuriance in valley or foothill. One half of the area of the county is suitable for its production. The acreage in fruit in 1891 was 23,937—bearing, 15,953; not bearing, 7,984. The acreage of the leading varieties is as follows: Prunes, 8,000 acres; peaches, 5,570; apricots, 4,350; cherries, 1,250; pears (mostly Bartlett), 900; plums, 900; apples, 750; almonds, 200; walnuts, 17; figs, 20; oranges, 40; lemons, 5; raisins, 1,400. Although citrus fruits do well in many places and fine qualities have been produced, they have never been cultivated for profit in this county.

All the berries do well; 800 acres of strawberries are set out. Blackberries, raspberries, and currants are also largely raised. There are about 1,500 acres in vineyard in this county, and a large crop of table grapes is raised, though the bulk is manufactured into wine and brandy.

Marketing of Fruits.—The fruit growers, canners, and driers of the valley have recently adopted a plan for marketing the products of this region which has proved highly satisfactory.

Stock Raising and Dairying.—Much fine stock is raised in this county. The breeding stables and farm of thoroughbreds at Palo Alto are widely known. The largest herd of short horns in the world is in this section. Dairying is extensively carried on near Gilroy and Santa Clara; the principal product is cheese. There were 61,275 pounds of wool shipped in 1892. Assessor's report for 1892 shows 11,842 horses, 25,030 cattle, 3,788 hogs, 101 mules, 4,218 sheep, 247 goats, and 7,580 dozen poultry.

Minerals.—The quicksilver deposits have been mined for many years and produced millions. In the mountains are found cinnabar, petroleum, chromite, bituminous rock, limestone, coal, and natural gas. There are large quarries of sandstone, from which Stanford University and other buildings were erected.

Education.—The county is rich in institutions for high and broad culture. The Stanford University, Academy of Notre Dame, St. Joseph's College, Santa Clara College, University of the Pacific, and the Normal School are the notable ones, and are equipped with every appliance which money and influence can procure to constitute them first-class halls of learning. The Lick Observatory is on Mount Hamilton, altitude 4,443 feet, and about 15 miles east of San José. Its endowment is \$750,000, and it has the largest refracting telescope in the world yet constructed, with a 36-inch object glass.

Prices of Land.—The prices of land are not high, considering the improvements, the richness of the soil, the ready central markets for all products, and the highly improved condition of the fruit ranches and vineyards, in the midst of a cultured and wealthy class of citizens. But there are yet unimproved lands which can be brought to the same state of perfect cultivation and improvement, to be secured at a reasonable price, when their income-producing power is taken into account.

SANTA CRUZ.

Santa Cruz is bounded on the north by San Mateo County, east by Santa Clara, south by Monterey, and west by the Pacific Ocean.

Statistics.—Area, 437 square miles, or 279,680 acres. Unentered Government land, 5,000 acres. Lands assessed, 258,902.50 acres. Total assessed valuation of all property, \$12,313,213. Rate of taxation, State and county, 1.60. Number of miles of railroad, 55.64; assessed at \$632,317. County property, \$84,000. County debt, \$136,000. Number of schools, 98. School children between 5 and 17 years, 5,250. School money, \$99,739 72. Population, census of 1890, 19,270.

County Seat and Principal Towns.—Santa Cruz, the county seat, with a population of 6,000, is situated on the ocean on the northerly side of Monterey Bay. It is a thriving, prosperous town, having fine county and business buildings, schools, and churches, four banks, two daily newspapers, two weekly newspapers, electric street railway, gas and water works, railroad connections with San Francisco by two railroad lines and by steamer, and elegant hotels. It has a perfect sewer system, fine paved or asphalt streets, and many manufacturing industries. The San Lorenzo River will soon be made to furnish power for electric lights, motors, and for other purposes. Many new buildings have been completed during the past year, and the city is in a very prosperous condition.

Watsonville is a fine town on the Pajaro River, population about 3,000, and is possessed of fine hotels, high and other public schools, churches, two banks, one daily and two weekly newspapers. Other towns are Soquel, Aptos, Felton, Glenwood, etc.

Topography.—This county is next to the smallest in the State. It extends along the Pacific Ocean for about 45 miles, and ranges from 12 to 20 miles wide. The Santa Cruz Mountains, on the northeast, separate it from Santa Clara County, and the Pajaro River from Monterey on the southeast. The mountainous land surrounding it, about 40 miles long and 18 miles wide, forms a basin sloping from the summit about 4,000 feet at its highest altitude, down southward and westward to the bay of Monterey. The inclosed crescent, averaging about 20 miles wide, is unsurpassed for beauty and variety of scenery. The innumerable ridges and spurs of the mountains are intersected by gorges, cañons, and narrow valleys. The sides of these are thick with trees and forests, some of them of gigantic size. Numerous streams and springs from the mountains furnish abundant water. Near the coast are leagues of wide, high, and grassy plateaus, furnishing remarkable grazing and dairy lands. There are a succession of chalk terraces, the broad valley of the Pajaro, salt lagunas, park-like groves of live oak, and high sandstone cliffs along shore. Along the coast-line are a series of benches of elevated land. These widen out south of Santa Cruz and form a large area of fruitful soil.

Soils.—From the town of Santa Cruz southeast, the soil is a light loam, rich in lime, potash, and phosphoric acid. Pajaro Valley varies from rich, sedimentary alluvial to light sandy soil of the foothills. In the lower part of the valley a clayey loam predominates, then heavy adobe higher up, followed by a dark red loam of the plains. The latter forms the favorite fruit soil.

Climate.—The temperature is most equable the year round. Surf bathing is indulged in in winter. The thermometer ranges only 10° between the average winter and summer temperature. The county is shielded from brisk winds by the mountains on the north, while the milder ocean breezes have free access. The average rainfall is about 25 inches.

Agriculture.—Cereals, hay, and vegetables are raised here in abundance, in proportion to the area subject to tillage, to compare favorably with any other county, though the holdings are all small, and chiefly devoted to fruit raising. The Assessor's report for 1892 shows: wheat, 5,312 acres; oats, 6,720; barley, 2,117; corn, 1,843; hay, 5,212. Many vegetables are produced, and some hops are raised. A very important industry is raising sugar beets for supplying the beet sugar factory. The beets of this section have a very high percentage of sugar, and are in demand. About 50,000 tons are produced annually, and an average of \$5 per ton is received for them. This gives about \$75 an acre, estimated to net a profit of \$50 to the producer. This business is profitable and is being extended.

Horticulture.—The principal fruit districts are the Pajaro Valley and the Santa Cruz Mountains. The total acreage in fruit is 7,386—4,180 bearing and 3,206 not bearing. The leading varieties in order are prunes, 1,982 acres; apples, 1,619; table grapes, 1,253; peaches,

772; apricots, 680; cherries, 340; pears, 333; olives, 124; small fruits, 260; walnuts, 13. The yield varies with varieties of fruits. The strawberry crop is very large, about 2,000 tons being shipped annually. Of raspberries and blackberries 500 tons are marketed. Strawberries have yielded as high as \$400 an acre gross. The prunes of Santa Cruz rival those of Santa Clara, and are of a large size and excellent flavor, commanding a high price in the Eastern markets.

Stock and Dairying.—About 50,000 acres are devoted to dairying and pasture. Each year 50,000 pounds of cheese and 1,000,000 pounds of butter are shipped. The Assessor's report for 1892 shows: Horses, 4,768; cattle, 5,771; hogs, 1,472; mules, 116; sheep, 1,014; goats, 187; poultry, 1,985 dozen.

Timber.—The redwood timber interests are very extensive. One third of the county is thus timbered, and there are many mills in the county. Redwood logs 20 feet long, and ten of them to a tree, are an average. One acre of this timber yields 1,000,000 feet of lumber. The "Giant," in Powder Mill Cañon, measures 300 feet high and 21 feet in diameter. There is still standing 1,100,000,000 feet of redwood.

Minerals.—Gold has been found in various places, but no systematic effort has been made to develop this resource. A quartz mine has been opened a few miles north of Santa Cruz. There are auriferous sands along the ocean beach. About \$150,000 worth of bitumen is mined and shipped annually, some of it going as far as Denver.

Manufactures.—The manufacturing interests of the county are many and their product runs into large figures. The principal products are beet sugar, about 6,000 tons, lime, powder, lumber, paper, leather, boots and shoes, wine, and canned fruit. Besides these there are many others of local use. Plans are being made for plants to manufacture the new smokeless powder. A scheme is maturing to utilize the San Lorenzo River for the purpose of generating electric power to run lights, street cars, and manufactories.

Fish.—There are over one hundred and fifty varieties of food fish in Monterey Bay, and the fishing business of Santa Cruz has become an important industry.

Health and Pleasure Resorts.—Thousands visit the splendid ocean beach of Santa Cruz yearly to enjoy the surf bathing and the beautiful drives into the hills. The hotel accommodations, baths, cottages, and provisions for amusement and recreation are all befitting a first-class seaside resort.

Prices of Land.—Land is comparatively reasonable in this county, and any industrious and energetic man who desires to engage in agriculture, dairying, or fruit culture, cannot fail to find an advantageous opening.

SHASTA.

Shasta County is bounded on the north by Siskiyou and Modoc Counties, east by Lassen, south by Tehama, and west by Trinity.

Statistics.—Area, 3,906 square miles, or 2,500,000 acres. Unentered Government land, 1,500,000 acres. Lands assessed, 976,958 acres. Total assessed valuation of all property, \$7,406,379. Rate of taxation, State and county, 1.95. Number of miles of railroad, 82.08; assessed at \$1,434,937. County property, \$81,000. County debt, \$96,456. Number of schools, 103. School children between 5 and 17 years, 3,302. School money, \$75,455 51. Population, census of 1890, 12,133.

County Seat and Principal Towns.—Redding, the county seat, with a population of 2,000, has fine county buildings, two banks, waterworks, gas and electric light plants, newspapers, excellent school and church buildings, a Masonic Temple costing \$35,000, the United States Land Office for the district, many first-class business buildings, and large warehouses. It is connected by rail with San Francisco and Portland. Anderson, on the railroad, and the center of the fruit district and junction of Shasta Lumber Company's railroad, has a large cannery, bank, newspaper, and extensive lumber yards. Cottonwood is a fruit center on the railroad. Other thriving places are Fall River Mills, with an immense waterpower and flour mills. Millville is a fruit center in the foothills. Igo, Ono, French Gulch, and Stella are mining towns.

Topography.—The rugged, lofty mountains of the Coast Range and Sierra Nevada, here approaching on the north, surround the county on all sides except the south. Inclosed by them is a semi-circle of valley and foothills and plateaus forming the head of the Sacramento Valley, and containing about 500,000 acres, with an elevation of from

500 to 2,500 feet. The central and southern portions consist of table lands of about 700 feet elevation. There are four high peaks on the east, including Lassen, which is 10,577 feet altitude. The principal rivers and creeks are Fall River, Pitt River, Hat Creek (upon which is located the United States hatchery), Roaring River, Montgomery, Squaw Creek, McCloud, and Little Sacramento. The total length of creeks and rivers in the county is 250 miles. The mountains on the north and east show volcanic origin and extinct craters, cones, sulphur and lava beds. Hot boiling springs abound.

Soils.—The valley soils are alluvium, largely intermixed with disintegrated rock and gravel; color, light red or reddish brown. The mesa, or table lands, are a sandy loam, with a large percentage of clay, carrying in the higher parts considerable gravel and bowlder. The foothills show red loam or clay, while to the southwest the soil is generally adobe. All of these soils are generally rich and productive for grain, grasses, vines, or fruit. In Burney Valley, over the crest of the Sierra, is a plateau which extends throughout this range and up into eastern Oregon. This plateau, having an elevation of 3,500 feet, has valleys, reclaimed swamp lands, and rolling highlands. The soil is muck in the swamps, and in reclaimed meadow land sandy, with clay admixture and subsoil.

Climate.—The average rainfall is variable in various locations. At Reed's Camp, in upper Sacramento Valley, for five years it was 71.8 inches annually; for the same period at Redding it was only 36.64 inches annually. As you ascend and go north, the average increases. The summer temperature at Redding ranges between 70° and 102°, the latter seldom. In December, January, and February it is never below 18°. The foothills have an excellent climate, neither extremely hot nor cold.

Irrigation is practiced very little, though a district of 20,000 acres has been organized in Happy Valley. There are about 18 miles of irrigating ditches.

Agriculture.—Agriculture is confined principally to raising wheat, barley, oats, hay, and vegetables for home consumption. Alfalfa succeeds well without artificial irrigation, and gives two crops a year and pasturage. The Assessor's report for 1892 shows: seeded to wheat, 16,400 acres; oats, 720; barley, 8,950; hay, 12,790.

Horticulture.—The principal fruit sections are Redding, Anderson, Cottonwood, Happy Valley, Dry Creek, Millville—the latter in the foothills. There are 2,161 acres in fruit—1,144 bearing and 1,017 not bearing. The fruits range as follows: Peaches, 826 acres; prunes, 680; apricots, 281; apples, 97; almonds, 81; pears, 83; olives, 37; cherries and oranges, 26 each; other varieties, 21. Many acres of table and raisin grapes are bearing; the acreage figures are not at hand. Orange trees do remarkably well, a fact which shows the great uniformity of climatic conditions prevailing all along the valleys and foothills of the Sacramento and San Joaquin throughout over 400 miles of latitude from Redding in this county south to Bakersfield in Kern County. The shipments of fruit from Anderson for 1892, from July 1st, were, green fruit, 288,000 pounds; dried, 240,000; total receipts, \$40,000. The shipments from Redding are also large. Thirty-one carloads were sent to Eastern and Oregon markets. Shasta is destined to take high rank in fruit production.

Stock Raising.—The southwestern district, with little timber and high, rolling hills with rich adobe soil, is given up to stock raising, as also is the Burney Valley over the eastern rim of the Sierra. This county raises many hogs. Turkeys are herded in large droves, and the business is very profitable. The Assessor's report for 1892 shows 6,037 horses, 15,101 cattle, 8,100 hogs, 388 mules, 11,000 sheep, 4,600 goats, and 2,000 dozen poultry.

Timber.—There is an immense body of valuable timber in the county, mostly sugar and yellow pine, on which eight large mills are at work, especially in Round Mountain region. One firm has a railroad from Anderson to their mills, and 30 miles of flume; the product is 60,000 feet daily. The total output of the county is 250,000 feet per day. Much lumber has been shipped from here to Australia, aside from home markets. An Eastern syndicate bought from 30,000 to 40,000 acres of timber land this spring. There are 1,600 square miles of forest.

Minerals.—The mining activity has been greatly increased during the past year. Gold is the principal product, and has been mined for years. The lodes are wide and easily worked. There is a silver-bearing belt which can be traced for miles. Chrome and magnetic iron ores abound. Much ore is shipped to San Francisco, to be handled there. The general mining interests of the county were never more prosperous. Much foreign capital has been invested. Shasta offers almost a virgin field for prospecting.

Pleasure Resorts.—Nowhere in California can be found more delightful summer resorts than on the Oregon Division of the Southern Pacific, in this county. For grand scenery, delicious mineral springs, refreshing mountain air, and trout fishing, no place offers greater attractions.

Prices of Land.—Good fruit land can be bought for \$20 an acre. Many colony tracts offer land at \$40 to \$60. The best lands, in the center of fruit districts, near the railroad, are worth as much as \$100 an acre. Much Government land can be taken up in more remote districts. Meadow lands in Burney Valley, on the east, can be bought for \$15 to \$30; pine lands from \$7 50 to \$15. In many fields Shasta holds out strong inducements to settlers.

SIERRA.

Sierra County is bounded north by Plumas County, south by Nevada, west by Yuba, and east by the State of Nevada.

Statistics.—Area, 781 square miles, or 499,840 acres. Unentered Government land, about 200,000 acres. Lands assessed, 297,077 acres. Total assessed valuation of all property, \$1,518,968. Rate of taxation, State and county, 2.75. Number of miles of railroad, 5.41; assessed at \$43,676. County property, \$11,500. County debt, \$16,900. Number of schools, 36. School children between 5 and 17 years, 1,006. School money, \$18,430 21. Population, census of 1890, 5,047.

County Seat and Principal Towns.—Downieville, the county seat, population about 1,100, altitude 3,000 feet, has three churches, schools, business houses, and the third oldest newspaper in the State. Sierra City is a mining center, and supports one newspaper. Sierraville, Port Wine, Forest City, and Gibsonville are important towns.

Topography.—This is preëminently a mountain and mining county. Sierra Valley, the largest body of level land, is 30 miles long and from 1 to 10 miles wide, and has an elevation of 5,000 feet. There are other small valleys. The mountain regions, which represent about 581 square miles, are lofty, rugged, seamed with chasms and cañons, and have many lakes and small valleys lying up among the loftiest peaks. Gold Lake, 4 miles by 2, is the source of the Middle Fork of Feather River.

Soils.—The soil of the valleys is usually a deep, black loam and rich vegetable mold.

Climate.—During midsummer the thermometer ranges from 80° to 90° in the day, with very cool and often chilly nights. In winter an Eastern temperature prevails, with snows 20 feet deep on the mountains, and quite deep in the valleys. Travel is then interrupted or done on snow shoes.

Irrigation.—Water is taken from abundant streams by private ditches, and land is irrigated at an expense of 50 cents an acre for labor only.

Agriculture.—Crops are raised only for home consumption. For 1892 there were sown 300 acres to wheat, 1,000 to oats, and 3,000 to barley; 20,800 acres were devoted to hay. Potatoes and other hardy vegetables are raised. The same conditions mainly govern crops under this head, as in the States of Indiana and Ohio. Peas and alfalfa are grown in a small way.

Horticulture.—Only the hardier fruits are safe here against early and late frosts. The most excellent apples are raised; also, to a slight extent, peaches, pears, plums, apricots, cherries, almonds, walnuts, and small fruits. There are 93 acres of fruit in bearing, of which 68 are apples. About 250,000 pounds of fruit were produced in 1892.

Stock Raising and Dairying.—Much attention is given to the making of butter of excellent quality, and many tons are produced yearly. Not enough hogs are raised to supply the demand, and scarcely any sheep are to be found in the county. The Assessor's report for 1892 shows 1,501 horses and 3,867 cattle. This should be one of the best dairy counties in the State.

Prices of Products.—Apples, 2 cents; peaches, pears, and plums, 4 cents; all berries, 10 cents per pound; potatoes, 1½ cents per pound; chickens, \$4 to \$6 per dozen; turkeys, from \$1 25 to \$2 each.

Lumber.—There are twenty saw mills and two shingle factories; annual output, 15,000,000 feet of lumber and 1,500,000 shingles. The timber, like that of adjoining counties, is practically inexhaustible.

Mining.—The chief industry of the county is mining. There are many quartz, drift, and hydraulic mines. Much foreign capital has recently been invested in these prop-

erties. The annual output of gold is about \$1,500,000, which will be vastly increased when hydraulic mining is resumed. There is good reason to believe that the former great gold yield of this county will be surpassed in the near future. This is an inviting field for the prospector and for mining capital.

Prices of Land.—Unimproved arable lands can be bought for \$5 an acre; grain and hay land for \$30.

SISKIYOU.

Siskiyou County is bounded north by the State of Oregon, east by Modoc County, south by Trinity and Shasta, and west by Humboldt and Del Norte.

Statistics.—Area, 6,078 square miles, or 3,889,820 acres. Unentered Government land, 2,400,000 acres. Lands assessed, 1,468,788 acres. Total assessed valuation of all property, \$8,422,386. Rate of taxation, State and county, 1.50. Number of miles of railroad, 83.18; assessed at \$1,454,167. County property, \$30,000. County debt, \$90,300. Number of schools, 77. School children between 5 and 17 years, 2,846. School money, \$55,758 72. Population, census of 1890, 12,140.

County Seat and Principal Towns.—Yreka, the county seat, population 1,600, is located in about the center of the county, 6 miles from the main line of the California and Oregon Railroad, with which it is connected by a branch line to Montague. Its altitude is 2,540 feet. It has fine county buildings, high and other schools, two newspapers, good hotels, and excellent brick blocks, and has recently built new waterworks. It has been prosperous the past year. Other towns are Fort Jones, with large flour mills, bank, and business houses; Etna Mills, with flour mills, etc.; Callahan's Ranch, Sawyer's Bar, Oro Fino, Sisson, Motts, Dunsmuir, and Montague, the latter a thriving railroad town.

Topography.—The Coast Range and Sierra Nevada meet in this county. There are about 576,000 acres of valley and tillable land, the rest is mountainous in the extreme. The principal valleys are Scott, Big and Little Shasta, and Butte Creek, where most of the grain and fruits are raised. Big Shasta is mostly grazing land. The mountains are very rugged, and covered with timber. Mount Shasta stands sentinel, at the head of the Sacramento Valley, with an altitude of 14,450 feet, and covered with perpetual snow. In the northeast are extensive lava beds. Siskiyou forms a part of a high plateau which extends into Modoc and Lassen Counties, and is from 3,500 to 4,000 feet elevation, surrounded by volcanic mountains. The principal rivers are the Klamath, with its large branches, viz.: the Shasta, Scott, Trinity, and Salmon. The Sacramento rises in the southeast of this county, and most of the McCloud is also contained within its boundaries.

Soils.—The soil of the valleys is mostly a rich black loam, especially Scott and Little Shasta, which are the most fertile and cultivated. Big Shasta is mostly grazing, though fertile with irrigation.

Climate.—The climate is like that of the Middle States, though milder in winter. Extreme heat of summer, 94°; extreme cold of winter, 4° below zero. Average, summer, 65°, and winter 40°. Average rainfall, 33 inches. Heavy snows fall in the mountains and much in the valleys. Winter travel is often on snow shoes among the hills.

Irrigation.—There is a scheme on foot to take 50,000 miner's inches from the Klamath River to irrigate 130,000 acres of Big Shasta Valley, and also to be used in a flume for carrying lumber. It will be completed in about two years. Cereals, fruits, and general crops are grown without irrigation in the fertile valleys.

Agriculture.—The grain and hay product of Scott and Little Shasta Valleys is very large. Much wheat is used by the local mills. Hardy vegetables grow abundantly anywhere in the valleys. The grain crops are sure, and the yield per acre is about 40 bushels in Scott and Little Shasta. The Assessor reports seeded in 1892, wheat, 16,914 acres; oats, 2,596; barley, 4,370; corn, 47; hay, 53,940.

Horticulture.—Apples are the main product. The total acreage in fruits is 1,584—bearing, 895; not bearing, 689. Of this, 1,212 acres are in apples. There were 140 carloads of fruit shipped during last season, many to Chicago, Boston, and New York. The other fruits raised are pears, plums, peaches, cherries, etc., only in small orchards for home use, and liable to fail from early and late frosts. The average price paid for apples is 1½ cents per pound, on the tree.

Stock and Dairying.—The dairy products of Siskiyou, like those of other well-wooded and watered mountain counties in the northern part of the State, have an excellent quality and wide reputation. The main industry, however, is stock raising. The Assessor reports 8,242 horses, 27,978 cattle (mostly stock), 3,328 hogs, 728 mules, 12,050 sheep, 65 goats, and 698 dozen poultry. There are large grass ranges in the county, and most of the stock is driven to warmer quarters in winter.

Timber.—The mountains are mainly timbered with sugar and yellow pine, red fir, and cedar. One of the most valuable sugar pine belts in the State begins about one mile from Edgewood, and much of this has been bought up since the advent of the Oregon and California Railroad. Several saw mills are in operation.

Mining.—The output of the precious metals is constantly increasing. The gold-bearing area is very extensive, and the methods of working very diversified. There are large areas of virgin hydraulic ground, which will become dividend-paying property so soon as a sufficient supply of water for working purposes is available. In the Klamath, at Honolulu, and other points above Humbug Bar, river mining is extensively carried on, with good yields. The R. H. Campbell Mining Company (limited), an English corporation, has acquired several hundred acres of hydraulic and drift ground, which they will work extensively. Callahan's Ranch district has greatly increased its output for the year. In the Salmon River section the old quartz mines are doing as well as formerly. This district has lost none of its prestige as the leading gold producer of the county. The county has also iron, coal, copper, cinnabar, marble, stone, onyx, etc. The mineral resources of the county are inexhaustible.

Prices of Land.—Much Government land can be obtained. Private grazing lands can be bought for \$2 50 an acre, and good agricultural lands from \$20 to \$50, according to quality and location.

Places of Resort.—For mountain scenery, trout fishing, hunting, and pure bracing atmosphere, no part of the State affords any more delightful ground in the summer. Sisson is a noted place of resort.

SOLANO.

Solano County is bounded on the north by Yolo County, on the east by Sacramento, south by the Sacramento River and Suisun and San Pablo Bays and Straits of Carquinez, and west by Napa County.

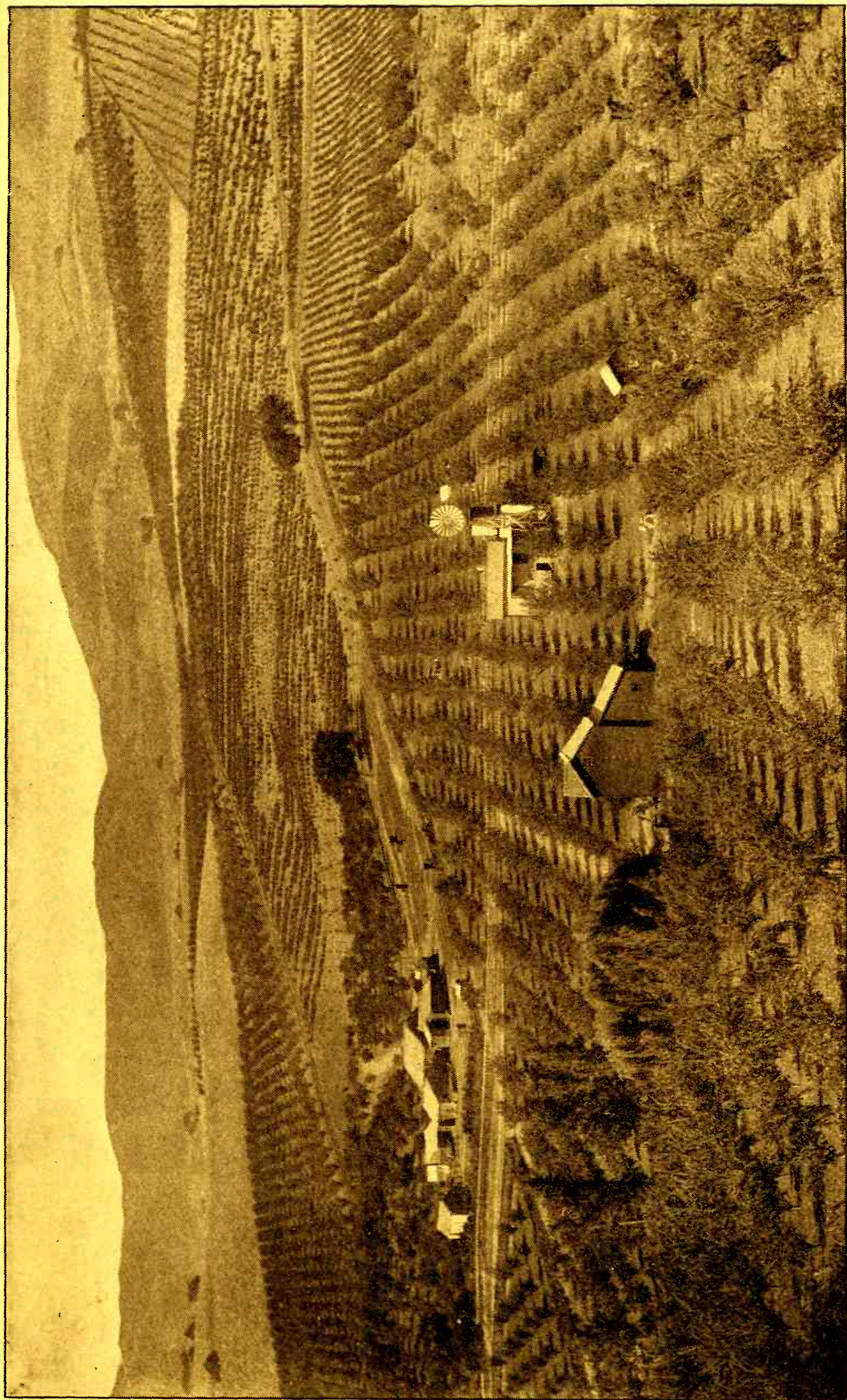
Statistics.—Area, 828 square miles, or 529,920 acres. Unentered Government land, 2,500 acres. Lands assessed, 515,828 acres. Total assessed valuation of all property, \$19,949,304. Rate of taxation, State and county, 1.20. Number of miles of railroad, 73.45; assessed at \$979,055. County property, \$90,000. County debt, \$32,285 57. Number of schools, 52. School children between 5 and 17 years, 4,513. School money, \$97,946 88. Population, census of 1890, 20,485.

County Seat and Principal Towns.—Suisun and Fairfield are practically one town; Fairfield is the county seat. There are substantial county buildings; the towns have banks, newspapers, substantial business blocks, large warehouses, and manufactories, and are the center of a large fruit-shipping section.

Vallejo, the chief city, located on the bay of the same name and connected by water and rail with San Francisco, has a population of 6,000. The city has banks, daily newspapers, fine schools and churches, good sewerage system, water, gas, and electric light works, and all the appliances of a modern city. The new water system, just inaugurated, to bring water a distance of 14 miles, will add much to the comfort and growth of the city. Its manufacturing interests are large. It has one of the largest flour mills of the State, extensive brick and terra cotta works, and leather manufactories. Its waterfront of 9 miles admits the largest sea-going vessels.

Benicia, population 2,600, also located on tide water, is noted for its educational institutions, the United States Government arsenal, large tanneries, which ship leather to many Eastern cities, ship-yards, agricultural implement works, salmon canneries, and other industries. Its manufactured products amount to \$2,500,000 annually.

Dixon, the leading town in the northwestern portion of the county, is in the heart of a large farming country. Its population is 1,100. It has banks, hotels, large lumber yards, fine business blocks, and extensive warehouses.



FOOTHILL ORCHARDS.

Vacaville, the great center of fruit production and shipping, population 1,000, is located on a branch railroad, 6 miles from main line, and is a prosperous and growing place. During the year many new residences have been erected, several handsome churches, large business blocks, and a \$25,000 hotel. It has fine streets and sidewalks, and good banking facilities. Other important towns are Elmira, Rio Vista, Binghampton, Rockville, Collinsville, and Bird's Landing.

The Navy Yard.—Mare Island Navy Yard is located in this county, and its presence contributes largely to the business activity of Vallejo.

Topography.—Of its area 100,000 acres are swamp and overflowed land, bordering on the Sacramento River and Suisun and San Pablo Bays. In the southeast the Montezuma Hills rise 300 feet above tide water, and are intersected by narrow ravines. In the southwest are the Townsend Hills, of nearly the same character. About two thirds of the county can be classed as valley lands; the remainder is foothills. A series of rolling hills, spurs from the Coast Range, extends from Vacaville to Putah Creek, averaging about 3 miles wide, the slopes and small valleys of which are noted for early fruits. On the west of these hills lies Pleasant Valley, extending to Putah Creek. The crest of the Vaca Mountains forms the dividing line between Solano and Napa Counties on the west. These mountains reach about 2,000 feet altitude.

Soils.—The soil of the swamps and overflow is formed of decayed vegetable mold and sedimentary deposits. In the Sacramento Valley portion it is a light sandy loam. In the trough of Vaca Valley it varies from sandy to clayey loam and sometimes to adobe. Through the hilly land east and northeast of Ulattis Creek, the soil varies from sandy to clayey. The soil in the western portion varies from 1 to 10 feet in depth, with sandstone or shale underlying. Vaca Valley is about 12 miles long and 2 miles wide. It is protected by surrounding hills and has a deep, rich soil.

Climate.—The southern and southwestern portions, on the bay, have a climate very cool and of even temperature, influenced by the bay and ocean breezes. In the interior valleys and in the northeastern plains, the summers are warm and sometimes hot, running up to 110°. The rainfall varies greatly according to locality; average annual precipitation, Benicia, 14.67; Vallejo, 14.55; Suisun, 20.10; Vacaville, 29.44 inches.

Irrigation.—No irrigation systems are found in this county. Any irrigation resorted to is obtained from wells, windmills, and pumps. For the production of fruits and cereals none is required.

Agriculture.—The raising of wheat and barley is confined principally to the eastern portion of the county. The yield is large and the farmers are prosperous. Dixon is the main center of this grain region. From 20 to 50 bushels of wheat to the acre have been harvested for a series of years. The certainty of crops is one feature of this section. The Assessor reports for 1892, wheat, 83,886 acres; barley, 31,359. As a matter of course, a large amount of vegetables of all kinds is raised in the county, especially in the fruit sections, where small farms are the rule, and cultivation more perfect. Their earliness creates a large demand at high prices in the San Francisco market.

Horticulture.—The distinguishing feature of the Vacaville and adjoining fruit sections is the earliness of its fruits. Cherries are often shipped by April 1st, apricots early in May, and all other fruits proportionately early through the fruit season. This gives the advantage of higher prices to the fruit growers. Cherries open at about 20 cents a pound; apricots, 25 cents; peaches, 20 cents. The principal fruit sections are Suisun and Vacaville. One of the largest orchards in the State is near the former place, comprising nearly 800 acres in full bearing, in almonds, cherries, peaches, pears, plums, prunes, apricots, nectarines, figs, grapes, currants, and gooseberries. Fruits mature in Vaca Valley from ten days to three weeks earlier than in most other sections of the State. The shipments to the East and to San Francisco in 1891 were 1,034 carloads, or 10,340 tons, of which one fourth was dried fruit. All this should represent a green fruit product of over 40,000,000 pounds. The figures for 1892 are not at hand, but the shipments are estimated at one fourth more, allowing for increase in number of bearing trees. In 1892 a number of carloads were shipped direct to New York, and thence by ocean steamer to England, where they were sold to great advantage. Prices received for fruits in 1892 average about as follows: Pears, 2½ cents per pound; peaches, 2 to 2½ cents; apricots, 1¾ cents; cherries, about 10 cents. It is difficult to ascertain the amount of the Eastern shipments of fruit from Solano County, as they are billed from Sacramento as the rail-

road terminal point. There are 18,900 acres of fruit in Solano County, of which 12,442 are bearing and 6,458 not bearing. Besides there is probably 5,000 acres of vineyard not included in above estimate. The varieties are ranged in the following order as to acreage: Peaches, apricots, pears, prunes, table and raisin grapes, almonds, cherries, figs, nectarines, olives, oranges, walnuts, apples, and lemons. There are 70 acres in oranges and 8 in lemons in a flourishing condition.

Stock Raising.—The stock interests of this county are of no small importance. The stock are mostly graded and of fine quality. Dairying is an important industry in the county. The tule and overflowed lands afford excellent opportunity for raising cheaply a large number of hogs. The Assessor reports 9,783 horses, 15,530 cattle, 7,782 hogs, 1,567 mules, 35,763 sheep, and 2,795 dozen poultry. The sheep are all graded stock.

Transportation.—The California Pacific Railroad runs from Benicia and Vallejo through the county to Sacramento, and connects at Napa Junction with road to Santa Rosa, Sonoma County. From Elmira the branch railroad runs to Vacaville and Winters. The Sacramento River and Suisun Bay afford water transportation.

Minerals.—The mineral resources of the county are not extensive, being mostly confined to deposits of onyx and marble in the western part of the county, the products of which are extensively used in San Francisco and the East.

Springs.—The Tolenas Soda Springs are a few miles from Vallejo; much money has been expended in improvements. The waters possess carbonic acid gas and various medicinal ingredients, supposed to be of great benefit to various complaints.

Prices of Land.—In the warm valleys of the fruit sections improved lands are worth from \$50 to \$500 an acre. In the northern part they range from \$20 to \$50. In the extreme foothills from \$2 50 to \$10.

SONOMA.

Sonoma County is bounded on the north by Mendocino, east by Lake and Napa, south by San Pablo Bay and Marin County, and west by Marin and the Pacific Ocean.

Statistics.—Area, 1,500 square miles, or 960,000 acres. Unentered Government land, about 40,000 acres. Lands assessed, 838,751 acres. Total assessed valuation of all property, \$30,860,796. Rate of taxation, State and county, 1.05. Number of miles of railroad, 160.97; assessed at \$1,627,060. County property, \$370,000. County debt, \$224,500. Number of schools, 189. School children between 5 and 17 years, 8,500. School money, \$154,504 52. Population, census of 1890, 32,691.

County Seat and Principal Towns.—Santa Rosa, the county seat, with a population of 5,500, is situated near the center of the county, and is connected by rail with Ukiah, Mendocino County, on the north, Napa and Sacramento on the east, and Petaluma and San Francisco on the south. The city is an elegant place of residence. Many San Francisco business men have fine properties here. It is the center of a large fruit and wine district, and is a busy and prosperous place. It has two immense wineries, numerous manufactories of flour, woolen goods, leather, iron products, canned fruits, doors, sash, blinds, and moldings, has four banks, two daily and four weekly newspapers, four street car lines, gas and water works, excellent public schools, colleges, and seminaries, and is a most delightful place for a home. A \$40,000 high school building will be soon among her attractions. The city has lately, by vote, resolved to construct and own a system of waterworks.

Petaluma, the next place of importance, has a population of 3,700, and stands at the head of navigation, and is the center of the butter, poultry, and dairy trade of the coast. It has three banks, two flour mills, a cannery, woolen mill, silk factory, three newspapers, excellent schools, and fine churches.

Healdsburg, population 2,000, is surrounded by fruit farms, has two banks, two newspapers, a cannery, etc. Here is located the Seventh Day Adventist College. Cloverdale, in the north, is the center of a fine fruit belt. It possesses a bank, newspaper, five churches, and good schools. Sebastopol, connected by a branch railroad with Santa Rosa, has in its vicinity three wineries, twenty-five fruit driers, and fifteen hop driers. Glen Ellen, the location of the Home for Feeble-Minded Children, is the center of a large wine district. Duncan's Mills is the terminus of the North Pacific Coast Railroad. There are also numerous other flourishing places.

Topography.—The eastern boundary of this county is the main Coast Range, whose highest peak, Mount St. Helena, has an altitude of 4,329 feet. It touches San Pablo Bay on the south, which gives water communication with San Francisco. There are 200,000 acres of valley land, 200,000 of rolling, or high table land, 200,000 acres of foothill land, 100,000 acres of mountain land, adapted to grazing, and about 80,000 acres of magnificent redwood timber. The largest valley in the county begins at Petaluma, and continues in a direct line to Cloverdale, on the north. The Sonoma Valley begins at the bay, and runs northerly 20 miles. There are 18 miles of bay shore-line, and more than 60 miles of ocean shore-line. The streams are the Russian River, running southwesterly through the county, and draining three fifths of its land; Petaluma Creek, and Sonoma Creek. Petaluma Creek is navigable for vessels of light draught. Small streams are numerous in all parts of the county. Petaluma and Sonoma Valleys are separated from the Santa Rosa basin by a slight divide, just sufficient to divide the watershed into south and north slopes. On the west is the Coast Range; southeast is Sonoma Mountain, 2,400 feet high. Bennett Peak and Mounts Taylor and Hood are farther north. Away northeast is Geyser Peak, 3,740 feet high, and beyond, St. Helena overlooks the whole scene. High up these mountain slopes are many of the finest homesteads of the county.

Soils.—Four fifths of the county's area is cultivable. In the valleys is rich alluvial soil, in the foothills a light, sandy soil, with clay subsoil. The hill soil is mixed with basalt boulders. The proximity of these boulders seems to stimulate vine growth. In the Healdsburg district the soil is a deep rich loam in the valleys, and red in the foothills, and exceedingly fertile. The southwest quarter of the county is a rich, red, cretaceous land, varyingly covered from six inches to a great depth with a very fine, rich, sandy loam, seemingly drifted by winds over the first coast range. This is wonderfully fine fruit soil.

Climate.—Mean annual temperature at Santa Rosa, 57°. In summer it is seldom above 85°. On some rare occasions in winter the thermometer registers 32°. The mercury seldom goes below 37°. Some snow falls on the surrounding hills, but very rarely in the valleys; it is very light, and never "comes to stay" a day. The average annual rainfall is obtained from forty years' observation, and is about 27.5 inches at Santa Rosa, and nearly 50 per cent greater at Cloverdale and above. In forty years there have been no crop failures, and no irrigation is required in this county.

Agriculture.—The principal lines of agriculture are wheat, oats, corn, barley, hay, hops, potatoes, tomatoes, and every conceivable line of vegetable products. The hop area is about 1,000 acres, and the yield is about 2,000,000 pounds. There are 10 flour mills which work on the wheat product. The southern portion turns out the most hay, the eastern slopes produce hops, the northern and western parts are fine dairy country. The Assessor's report for 1892 shows 9,740 acres of wheat, 5,810 of oats, 8,715 of barley, 4,210 of corn, and 8,965 of hay. Tons of vegetable products are shipped to San Francisco.

Horticulture.—Fruit raising is the main industry of Sonoma, and in this she takes a front rank. There are 12,637 acres of orchard, of which 7,989 are bearing and 4,648 not bearing. The new plantings are 1,426 acres. The varieties in above occur in the following order of importance: Apples, 4,121 acres; prunes, 2,599; peaches, 2,507; pears, 1,407; table grapes, 627; olives, 607; cherries, 317; apricots, 229; walnuts, 80; almonds, 70; figs, 51; plums, 20. Berries are always and everywhere a sure and abundant crop. The leading fruit districts are Healdsburg, Cloverdale, Sebastopol, Santa Rosa, Green Valley, Petaluma, and Sonoma. Most of the fruits are dried or canned, though large quantities are shipped green. There are eight to ten large packing establishments in Santa Rosa, Petaluma, Sonoma, and elsewhere, which consume about 30,000,000 pounds of fruit in a season. Citrus fruits are extensively raised around Cloverdale, and do well. Sonoma stands second in olive growing to Santa Barbara, and in prunes to Santa Clara County.

Viticulture.—Notwithstanding this immense fruit output, the vineyard and wine interests are still greater. There are over 22,000 acres in vineyard, the product of which is mainly consumed in making wine and brandy. The brands of Sonoma clarets, burgundies, hocks, rieslings, and other wines have a national and even a foreign reputation. There are enormous vineyards and wineries distributed throughout the county; at Healdsburg, Windsor, Cloverdale, Glen Ellen, Santa Rosa, and other sections. About 3,000,000 gallons of wine are produced annually, and 40,000 gallons of brandy.

Stock and Dairying.—The raising of stock and the manufacture of butter and cheese is a large business in this county. Petaluma is the chief center of shipments and trade. Over 3,000,000 pounds of butter and about 500,000 pounds of cheese are made annually. The wool interest is heavy also, the clip being about 1,000,000 pounds. There are many fine breeds of stock—horses, cattle, and sheep. The Assessor's report for 1892 shows: Horses, 93,521; cattle, 27,038 (of which about 18,000 are cows); hogs, 11,910; mules, 315; sheep, 94,010; goats, 335; poultry, 4,910 dozen.

Timber.—There are about 19 saw mills in the county engaged in working up the magnificent redwood forests in the western portion of the county, especially in the Russian River bottoms. About 60,000,000 feet are cut annually, and over 10,000,000 shingles. Considerable laurel and madrona are found, also chestnut oak for tan bark, live oak, and burr oak; the latter is found in all the valleys. Guerneville is the lumber center, and has shipped more bulk freight than any town in the county.

Minerals.—Cinnabar, or quicksilver, is the principal mineral deposit. Coal is worked in some localities. The quarrying of basalt paving blocks is quite an industry. Near Sebastopol are tinted ochres and other minerals. Potter's clay and gypsum are also found. The coal beds recently discovered on Mark West Creek are being developed.

Places of Resort and Interest.—The mountains abound in mineral springs and health resorts, the most noted being the Geysers. The "Petrified Forest" is also an object of interest.

Prices of Land.—Prices of land in this county, which is so well settled and highly cultivated and developed, must necessarily be high, but they are not high considering the productiveness and the income-producing capacities. The settler of some means will find a delightful home in this county.

STANISLAUS.

Stanislaus is bounded on the north by San Joaquin and Calaveras Counties, east by Calaveras and Tuolumne, south by Merced, and west by Santa Clara.

Statistics.—Area, 1,450 square miles, or 928,500 acres. Unentered Government land, about 100,000 acres. Lands assessed, 828,517 acres. Total assessed value of all property, \$17,083,750. Rate of taxation, State and county, 1.35. Number of miles of railroad, 79.49; assessed at \$927,308. County property, \$70,850. County debt, \$25,504. Number of schools, 70. School children between 5 and 17 years, 2,371. School money, \$62,205 57. Population, census of 1890, 9,992.

County Seat and Principal Towns.—Modesto, the county seat, population 2,500, has first-class county buildings, substantial business blocks, good hotels, schools, churches, two banks, two newspapers, water and gas works, good streets and sewers, flour and planing mills, and large grain warehouses.

Oakdale, on the Stanislaus River, 14 miles northeast of Modesto, population 1,200, is the center of a large grain and fruit region. It has a bank, two newspapers, four hotels, fine Odd Fellows and Masonic buildings, waterworks, large machine and wagon shops, and several large grain warehouses. Knight's Ferry, in the foothills, has fine orange groves, vineyards, winery, and flour mills. Other towns are Waterford, Montpelier, La Grange, Ceres, Turlock, Grayson, and Newman—all grain-shipping places with large warehouses.

Topography.—The county extends from the Sierra foothills on the east to the Coast Range on the west. The San Joaquin River flows north through the center of the county. The Stanislaus and Tuolumne Rivers flow west from the Sierra, nearly parallel about 10 miles apart, and empty into the San Joaquin. The San Joaquin is navigable for eight months of the year. The greater portion of the county is level plains, lowest near the San Joaquin, and having on the Stanislaus and Tuolumne bottoms three benches of land.

Soils.—On the east side of the San Joaquin the soil is generally sandy loam, becoming somewhat heavier as you approach the foothills. Along the river bottoms is found a rich sedimentary alluvial soil of great depth. The west side of the San Joaquin is a rich loam of great depth, and, with irrigation, wonderfully fertile. Both the east and west side lands are excellent for grain and fruit, but the east side has more rainfall and moisture, and the grain crops are surer.

Climate.—The climate is like that of Merced and Fresno Counties, though not quite as warm in summer. The mercury sometimes reaches 110° in July or August, but only a few days. From the middle of September to the middle of June no more delightful climate could be desired. The average rainfall is about 10 inches at Modesto, 13 inches at Oakdale, and more still at Knight's Ferry, in the foothills.

Irrigation.—Irrigation is recognized as essential to bring out the best results of the rich lands of this county, and a grand system is now being built under the Wright Act. A stone and concrete dam at La Grange, on the Tuolumne, is being constructed at a cost of \$500,000, which, when completed, will be 129 feet high, 20 feet thick and 320 feet long at the top, and 90 feet thick and 60 feet long at the base. This will be the highest weir dam in the United States, and will have an overflow at high water of over 160,000 cubic feet a second. This reservoir will supply the Turlock district, south of the Tuolumne, 177,000 acres, and the Modesto district, north, 81,000 acres. The cost of the entire system will be \$1,100,000, and the cost of water per acre will be about the same as under similar systems in Fresno and Tulare.

Agriculture.—This county has, on several occasions, proved the banner wheat district of the State, raising over 5,000,000 bushels of wheat in 1872, and 6,500,000 bushels in 1882. Its annual crops of wheat, barley, and hay are still immense. The east side is generally sure for a crop. In extremely wet seasons, the product on the west side is enormous. Around Modesto and Oakdale immense quantities of vegetables, corn, potatoes, tomatoes, and alfalfa are raised, especially along the rich bottoms of the Stanislaus and Tuolumne Rivers. The Assessor reports for 1892, wheat, 260,339 acres; oats, 215; barley, 35,163; corn, 90; hay, 1,800. The warehouse storage capacity of the county is immense—at Oakdale, Waterford, Montpelier, Modesto, Ceres, Turlock, and convenient railroad points between. The grain is harvested with combined harvesters, which head the grain and dump it off sacked in the rear of the machine.

Horticulture.—Fruit raising is carried on at Modesto, Oakdale, and Knight's Ferry, especially along the river bottoms, where thorough cultivation and porous, damp soil render irrigation unnecessary. Some places use deep wells and steam pumps, or pump from the rivers. When the irrigation system is completed, a much larger area will be devoted to fruit and vines. All varieties of fruits do well. For a long time, Knight's Ferry has produced large quantities of the finest oranges in the State. The other sections also successfully produce oranges. The leading deciduous fruits are apricots, peaches, apples, figs, prunes, and pears. Almonds do especially well. There are 1,306 acres of fruit trees in the county, of which 603 are bearing and 703 not bearing, and in the following order of importance: Peaches, apricots, apples, pears, figs, oranges (112 acres), prunes, cherries, almonds, olives. The trees on the river bottoms make enormous growth, and bear immense crops. There are many acres of vineyard in the county. Many table grapes are raised, and considerable wine and brandy produced.

Stock Raising.—There are large bands of cattle and sheep in this county, most of them being driven to the mountains of Tuolumne and Alpine Counties for summer range. Much attention is paid to breeding fine horses, and excellent grades are the result. The Assessor's report for 1892 shows: Horses, 10,784; cattle, 14,069; hogs, 6,780; mules, 4,255; sheep, 61,976; poultry, 2,630 dozen.

Timber.—The timber of Stanislaus, used mostly for fuel, is scattering groves of white and live oak, and the scrub pines of the foothills.

Prices of Land.—Farming lands range from \$25 to \$50 an acre, according to quality and location. The best bottom fruit lands cannot be bought for less than \$75 to \$100 an acre, near the central shipping points. Remote from the towns lands are much cheaper. On the west side of the San Joaquin the Miller & Lux irrigation canals have brought water to a large acreage, which is now being devoted in small tracts to alfalfa, orchards, and vineyards, and 10-acre and 20-acre farms are no longer a novelty.

SUTTER.

Sutter County is bounded on the north by Butte County, east by Placer and Yuba, south by Sacramento, and west by Colusa and Yolo.

Statistics.—Area, 610 square miles, or 390,400 acres. Lands assessed, 374,531 acres. Total assessed valuation of all property, \$9,533,010. Rate of taxation, State and county,

1.00. Number of miles of railroad, 36.63; assessed at \$307,970. County property, \$52,000. County debt, \$11,000. Number of schools, 42. School children between 5 and 17 years, 1,275. School money, \$31,794 61. Population, census of 1890, 5,465.

County Seat and Principal Towns.—Yuba City, the county seat, is located on Feather River, about a mile from Marysville, in Yuba County, with which place it is connected by street car line. It has fine county buildings, bank, excellent schools, newspapers, and no saloons, as a prohibitory law exists in the county. The cannery located here does a large business, employing 500 people during the packing season. Other towns are Live Oak, Meridian, Sutter City, Nicolaus, Pleasant Grove, etc.

Topography.—This small and fertile county has the Sacramento River for its western boundary, and is the only one in the State which lies wholly in the great valley. With the exception of the isolated Marysville Buttes in the northern part, it is one great plain. The Buttes furnish excellent grazing. About 125,000 acres of the county are tule, or overflowed lands. The northern 10,000 acres of this body, reclaimed by levee system, are immensely fertile and very valuable.

Soils.—The lands are mostly dark loams. On the higher elevations some gravelly clay; north and south for some distance from the Buttes are some stiff adobe soils, also in the lower grounds south of Yuba City and along the swamp lands. All the lands are extremely productive.

Climate.—The climate is similar to Yuba County. Perhaps for a few times in January the thermometer may mark 20°, yet the mean would be about 40° for the month. The mean temperature for winter is 47°. The extreme for summer is 106°; the mean 76°. Prevailing south winds during 250 days of the year give a cool and refreshing atmosphere. The average annual rainfall is 19½ inches.

Irrigation.—No irrigation is required in this county, except in special and limited situations among the hills, or where oranges and lemons are grown, which require it to some extent.

Agriculture.—The lands of this county are not in large holdings. Wheat farming is carried on at a minimum expense, and the yield per acre is often 40 to 50 bushels. Alfalfa, the king of forage plants, produces three or four crops a year without irrigation, besides affording several months of pasture. Enormous quantities of vegetables, tomatoes, etc., are raised, and hops are an important and profitable crop. The Assessor reports for 1892, wheat, 78,887 acres; oats, 106; barley, 19,887; corn, 130; hay, 8,421.

Horticulture.—Fruit raising has become of leading importance. The crop is generally sure and abundant. The acreage in fruit trees and vines is about 4,000. All the deciduous and citrus fruits flourish here. The leading varieties in order of importance are peaches, apricots, grapes, prunes, pears, plums, cherries, nectarines, oranges, figs, lemons, almonds, apples, olives, and berries. About 16,000 tons of fruit were produced in 1892, of the value of \$480,000 net at the orchard, at 1½ cents a pound, though in many cases higher prices were obtained. Most of the fruits go to the canneries at Yuba City, Marysville, or from the southern districts to Sacramento and San Francisco. Much is shipped green by car East, and a large quantity dried. The cannery at Yuba City packed in 1892, as follows: Peaches, 1,113 tons; apricots, 170; Bartlett pears, 120; plums, 170; grapes, 24—filling 1,080,000 cans, and shipped 155 carloads. The Briggs Early May peach originated in this county. The Thompson Seedless grape was first propagated in the county. This small grape, entirely seedless, matures early and evenly, yields from 10 to 15 tons to the acre in full bearing, and is easily cured; 3½ pounds of grapes make 1 pound of raisins. It is being extensively planted all over the interior valleys. The Muscat grape is also largely grown for raisins. There are 2,845 acres of fruit trees in the county—1,811 bearing and 1,034 not bearing.

Stock Raising.—Stock raising and dairying are important interests. Stock are always first class on the low lands bordering the tules and overflowed districts, and the large acreage in alfalfa furnishes the choicest feed. The Assessor's report for 1892 shows: Horses, 5,816; cattle, 7,493; hogs, 8,839; mules, 1,704; sheep, 29,374; poultry, 2,806 dozen.

Transportation.—This county possesses exceptional advantages in the transportation of its products. The navigable river on its western boundary gives cheap carriage for grain and fruits, and Marysville, just across the eastern boundary, is a terminal point for Eastern freights. The railroad to Knight's Landing gives outlet to San Fran-

cisco, and at Marysville is the Oregon and California, connecting with Portland or Sacramento. River transportation makes low rail tariff.

Prices of Land.—Unimproved fruit lands in the fruit districts are worth from \$50 to \$150 an acre; improved orchards, from \$200 to \$400 an acre; first-class grain land, from \$40 to \$75. Many subdivisions of large tracts have been made, and are in the market for settlement.

Socially and morally this county holds a high position. Under the law there can be no saloon in the county. The schools are of the best, and liberally supported. The people are law-abiding, industrious, and progressive. The county jail is empty, and litigation is rare. As a consequence, the tax rate is low, and there are few delinquents.

TEHAMA.

Tehama County is bounded on the north by Shasta County, east by Plumas and Butte, south by Butte and Glenn, and west by Mendocino and Trinity.

Statistics.—Area, 3,125 square miles, or 2,000,000 acres. Unentered Government land, 500,000 acres. Lands assessed, 1,110,103 acres. Total assessed valuation of all property, \$11,474,660. Rate of taxation, State and county, 1.45. Number of miles of railroad, 57.83; assessed at \$847,128. County property, \$75,000. County debt, \$85,500. Number of schools, 62. School children between 5 and 17 years, 2,624. School money, \$56,068 27. Population, census of 1890, 9,878.

County Seat and Principal Towns.—Red Bluff, the county seat, population 2,508 in 1890, is situated on the banks of the Sacramento River. It has fine county buildings, excellent hotels (two of which were built last year), two banks, two daily newspapers, excellent school buildings and churches. Its cannery, organized last year, put up 10,000 cases of fruit. Its large sash and door factory turns out annually 45,000 doors, 30,000 sash, and 10,000 blinds. A 70-mile V flume brings sugar pine lumber here from the mountains. The business blocks and residences of this town are first class, many of them elegant, and adorned with shade trees, orange trees, shrubs, and flowers. It was formerly the head of navigation, and under the proposed improvement of the rivers by the United States bids fair to resume its former prominence as such. Tehama, the junction of two railroads, is the next important place. It has fine hotels, business blocks, flour mills, and immense warehouses. Vina is the station of the famous Stanford vineyard. There are other minor towns, and all are progressive and prosperous.

Topography.—This county contains about 2,000 square miles of mountains, and 795 of foothills. There are 265 miles of valley lands, or 169,600 acres. The Sacramento River flows through the valley from north to south. On the west the valley rises into low, level prairies, then into broken hills, with the steep and rugged Coast Range beyond. Numerous streams flow east into the Sacramento. On the east the valley is bounded by a lava flow, extending for 20 miles or more up the western slope of the Sierra Nevada, which beyond become very precipitous, and rise to 10,000 feet altitude.

Soils.—Some of the finest soils are to be found here. They are mainly alluvial, and of volcanic origin. On both banks of the Sacramento is rich alluvium. On the east dark brown, almost black sandy loam, many feet deep. Farther east slightly rolling hills, of a reddish soil, soon running into the lava. On the west the plain of tillable lands is wider; the soil is of a reddish tinge. The loamy river lands merge into a second bottom of clayey loam; then the sandier soil of the plains, from gray to brown and red; then rolling hills, with reddish soil and gravelly loam; then bald hills of gray, brown, red, and sometimes black, clayey loam; then still higher hills of similar soils, ending in the pine-clad Coast Range.

Climate.—Tehama has a winterless climate. The summer extreme is 108°, winter 28°, but this only in August and January, and for a short period only. The mean annual temperature is 63°. The mean for January is 45°, and for August 83°. The average rainfall is 30 inches. Cereals never knew a failure in this county. The climate of Red Bluff is as mild as that of Riverside, over 300 miles south.

Irrigation.—There are 68 miles of irrigating ditches, of which 55 miles belong to one ranch and vineyard. The waters of this system are taken from Deer Creek. For vegetables, fruit, and alfalfa irrigation is needed to give the best results, though success in many orchards is obtained without irrigation.

Agriculture.—The grain crop of Tehama County is very large. The average yield of wheat is about 1,500,000 bushels annually. Immense crops of alfalfa are grown, one ranch alone producing 20,000 tons a year, with four crops. All vegetables can be successfully grown in these soils. The annual peanut crop is over 1,000,000 pounds. The Assessor reports, for 1892, acres sown, wheat, 60,841; barley, 15,594; oats, 3,138; corn, 819, hay, 17,912.

Horticulture.—This county produces successfully all deciduous and citrus fruits, though not much attention has been paid to the latter. Indeed, of deciduous fruits, last year witnessed the first carload shipments to Eastern markets. But the immense fertility and productiveness of these lands, together with the perfectly adapted climate, combine to stimulate increased attention to fruit culture. Last season a cannery was established at Red Bluff, which turned out 10,000 cases of fruit. Carloads of green fruit were shipped to San Francisco, Portland, Chicago, New York, and St. Louis. Nowhere else can you see more varieties of fruits and shrubs growing in one garden than here—citrons, olives, hickory nuts, chestnuts, oranges, lemons, Japanese persimmons, all the range from apples to bananas. Though large green fruit shipments are made, the crop is principally dried and canned. There are in the county 7,360 acres in fruit trees and table and raisin grapes, of which 4,302 are bearing and 3,058 not bearing. The order of importance is as follows: Peaches, 3,182 acres; prunes, 1,328; table and raisin grapes, 917; apricots, 574; pears, 517; almonds, 366; figs, 125; olives, 107; apples, 86; cherries, 59; walnuts, 30. This county will take a front rank when all its acres are in bearing. The plant of last year was nearly 1,000 acres. The largest wine vineyard in the world is at Vina, containing 3,825 acres, to be increased to 5,000. Its storage vaults cover 2 acres. Its storage casks hold 600,000 gallons. Four steam grape crushers use up 100 tons a day, each turning out 1,400 gallons of wine daily and running steadily four months. Over 500,000 gallons of wine and brandy are made yearly. The ranch also has about 20,000 fruit trees, 5,000 acres of wheat, 2,500 of barley, 1,000 of Egyptian corn, and 2,000 of alfalfa, producing 20,000 tons a year. There are 25,000 sheep on the ranch and some of the finest horses and cattle in the State. Nowhere can so many branches of farming be seen carried on upon so large a scale. Some of the best orchardists of the State have located large orchards in this county—one of 580, one of 446, one of 300, and one of 250 acres. This, if nothing else, proves the section to be first class for fruit production.

Stock Raising and Dairying.—This county is a favorite stock section, on account of its rich lands and abundant rainfall, natural grasses, crops of feed, and excellent water supply. About 2,500,000 pounds of wool are shipped annually; some probably coming from adjacent counties. The stock are mostly driven to the mountains for summer range. According to the Assessor's report for 1892, there are 5,517 horses, 13,202 cattle, 9,993 hogs, 1,730 mules, 169,493 sheep, 583 goats, and 2,017 dozen poultry.

Timber.—There is a fine belt of pine timber of 15 miles by 40, in the mountains, where several large sawmills are operated. The annual output is over 20,000,000 feet. A 70-mile V flume carries the lumber to the railroad at Red Bluff.

Minerals.—There are traces of mineral deposits, but the overflow of lava in the eastern part of the county has covered up the usual deposits in the Sierra Nevada.

Prices of Land.—Prices of land in Tehama County are not high. The hill and plain lands sell at low figures, from \$5 to \$10 an acre in many cases. The river bottom and choice lands sell at much higher figures, and they should do so when you consider their capacity for producing income. There are several colonies here, where lands are sold on reasonable terms and long payments.

TRINITY.

Trinity County is bounded on the north by Siskiyou County, east by Shasta and Tehama, south by Mendocino, and west by Humboldt.

Statistics.—Area, 2,625 square miles, or 1,680,000 acres. Unentered Government land, 1,100,000 acres. Lands assessed, 397,700 acres. Total assessed valuation of all property, \$1,427,674. Rate of taxation, State and county, 2.75. Number of miles of railroad, none. County property, \$11,000. County debt, \$48,519 81. Number of schools, 18. School children between 5 and 17 years, 721. School money, \$14,738 46. Population, census of 1890, 3,685.

County Seat and Principal Towns.—Weaverville, the county seat, with 600 population, has substantial county buildings, brick store, comfortable dwellings, and the only newspaper in the county. Other towns are Trinity Center, Lewiston, Trinity Bar, Junction City, Douglas City, and Cinnabar. These are all mining towns.

Topography.—This is a rough, mountainous county, remote from railroads, with two valleys of importance for tillage—the Hay Fork in the west and Trinity Valley in the northeast. The county is inclosed by mountains on three sides—Scott Mountains on the north, the Shasta on the east, and the Coast Range on the west. From all these numerous spurs extend into the county so that the most of its surface is broken and rugged. Numerous streams, all rising in the county, flow westward to the ocean. The principal stream is Trinity River, with its numerous tributaries. This river empties into the Klamath in the northern part of Humboldt County.

Soils.—The soil of the two small valleys is good grain, fruit, and vegetable land, to judge from its products, though no definite description of its character is at hand.

Climate.—The summers are pleasant and cool, the winters quite severe and much snow falls, interrupting travel, except on snow shoes, much the same as in Siskiyou County. The annual rainfall is large, probably between 40 and 50 inches.

Agriculture.—The products of the two small valleys are wheat, barley, oats, corn, hay, and vegetables, all for home consumption. The Assessor reports for 1892 the following acres sown: Wheat, 1,500; oats, 290; barley, 160; corn, 320; hay, 4,100.

Horticulture.—The acreage of trees and vines is 245—bearing, 185; not bearing, 60. The varieties are, grapes, 60 acres; pears, 50; apples, 42; peaches, 35; walnuts, 20; small fruits, 30. The apples are choice, the other fruits excellent, and all are sold for home consumption.

Stock.—The Assessor's report for 1892 shows 1,080 horses, 3,868 cattle, 160 hogs, 161 mules, 6,320 sheep, and 420 dozen poultry.

Timber.—There is an immense belt of sugar pine about 20 miles wide on South Fork Mountain, in the southwestern part of the county. Some mills are at work for local trade only. This interest awaits development when transportation is cheaper.

Mining.—For forty years this county has poured forth a stream of gold. Its annual product in the 50's reached four or five millions, falling off to a million and a half in the 60's, and is about half a million at present. Its mines are feeling the impulse of revival and new capital, and doubtless the yield will be greatly increased in the near future. The wealth of Trinity County is in its gravel mines. There are about eighty hydraulic claims, covering near 8,000 acres of patented land. No objection has been made to the working of these mines, as their debris does not interfere with river navigation. Quartz mining is attracting attention.

A large acreage of Government land is open for settlement in this county.

TULARE.

Tulare County is bounded on the north by Fresno County, east by Inyo, south by Kern, and west by Fresno and Monterey.

Statistics.—Area, 6,406 square miles, or 4,099,840 acres. Unentered Government land, 1,500,000 acres. Lands assessed, 1,645,543 acres. Total assessed valuation of all property, \$25,201,015. Rate of taxation, State and county, 1.40. Number of miles of railroad, 143.30; assessed at \$1,442,832. County property, \$88,750. County debt, \$41,500. Number of schools, 162. School children between 5 and 17 years, 7,109. School money, \$149,641 43. Population, census of 1890, 24,875.

County Seat and Principal Towns.—Visalia, the county seat, population 3,500, has excellent public buildings, a \$30,000 school house, a daily and two weekly newspapers, seven churches, three banks, two railroads, the United States Land Office of the district, good hotels, substantial business blocks, and elegant residences.

The other leading towns are Tulare City, on the main line, population 3,000, with two banks, daily newspaper, fine blocks, and large warehouses. Hanford, on the branch railroad, with bank, newspaper, good hotels, and fine opera house in course of construction. Porterville is on the railroad from Fresno to Poso, near the foothill region, and in the orange belt, and has a bank, two newspapers, mills, good hotels, and business buildings. Traver, Goshen, Armona, Lemoore, and Dinuba, besides many small places, are important shipping points.

Topography.—The county extends from the Coast Range on the west across the San Joaquin Valley to the summit of the Sierra Nevada on the east, the highest peak of which is Mount Whitney, 15,046 feet altitude, the loftiest in the United States. The western slope of the Sierra is covered with heavy forests, including the largest specimens, and in great numbers, of the Big Trees (*Sequoia gigantea*). These are included in the Government reservation of Sequoia National Park. The valley portion of the county comprises about 1,136,000 acres of first-class land; the slopes of the mountains about 2,454,000 acres, of which one third may be cultivated.

Soils.—The soil of the valley is mostly a sandy loam, without sod, and unmixed with gravel; that of the lower Sierra foothills and of the mountain valleys is a dark, rich loam. In all parts of the county the soil is very deep. There are large tracts of white ash land well adapted for raisin grapes. The richest soil is that of the Kaweah delta, rich in humus, capable of producing anything that grows.

Climate.—The summer climate is dry and warm, with cool nights; the winter or rainy season seldom reaches 32°. Little frost is known. Near the Sierra foothills is a specially warm belt, which, with a most favorable soil and abundant water for irrigation, furnishes one of the best orange and lemon districts in the State. The extreme temperatures for Tulare City are, summer 111°, winter 31°; for Lemoore, summer 110°, winter 25°. The average annual rainfall is, for Lemoore, 6.31 inches; for Tulare City, 8.22 inches.

Irrigation.—Abundant water is brought from the snow-clad Sierra by perennial rivers and streams, which flow into and through the valley, and which are extensively utilized by a large system of canals for irrigation purposes. The maximum discharge of these streams during the rainy season and "snow rise" is 26,000 cubic feet per second, sufficient, even with wasteful use, to irrigate 4,000,000 acres. The average discharge for the year is 4,000 cubic feet a second, and the discharge during the irrigating season varies from 6,000 to 10,000 feet a second, sufficient, if properly distributed, to irrigate all the cultivable lands of the county. Reservoirs, for which the mountain regions afford many fine sites, would greatly increase the available supply. The water supply of the Coast Range is of value to only a few small valleys. There are 600 miles of large main canals in the county, and 800 miles of laterals. There is also a large number of artesian wells in the western half of the valley, supplying abundant water to a large area; one well flowing 35,000,000 gallons a day. The cost of irrigation for grain and alfalfa is about \$1 an acre for the first year, and about 50 cents an acre thereafter. For trees and vines very little is used after the second year.

Agriculture.—Tulare claims to be the banner wheat county of California, with 450,000 acres in wheat, barley, and corn. Both Egyptian and Indian corn are grown as a second crop the same year, after wheat and barley are harvested. The most valuable product for hay or pasturage is alfalfa, which in this county under irrigation yields from three to six crops annually and which may be used for pasturage ten months out of the twelve. There were probably 100,000 tons of wheat for export in 1892. No figures of the alfalfa yield are at hand, but the amount is enormous. The Assessor reports for 1892, area sown to wheat, 358,700 acres; oats, 400; barley, 75,000; corn, 2,000; hay, 25,000. Vegetables of all kinds, without limit, can be raised on the rich soils of this county.

Horticulture.—Fruit raising is becoming the most important business of Tulare, for success in which its rich soils, ample irrigation facilities, level lands, and unparalleled climate amply qualify it. The principal fruit sections are the Kaweah delta—the region about Visalia and eastward to the foothills—around Tulare City, the Lucerne district around Hanford, Lemoore and Grangeville, around Traver, and the foothill citrus belt, including Porterville, Plano, Orisi, and Dinuba. All of the above named districts are especially adapted to the stone fruits, the prune leading, followed by the peach, apricot, pear, and olive. A three-year-old peach tree yields 175 pounds, and in full bearing 250 pounds, realizing \$100 an acre profit. Apricots yield about the same profit, but do not bear so regularly. The earlier varieties of plums return a greater profit than peaches. The French prune of California yields, however, the best results of all. In the Kaweah delta its product is marvelous; six-year-old trees sometimes bear 1,000 pounds. A sworn statement of witnesses to the weighing of the crop from one six-year-old tree—one being a member of the State Board of Horticulture, another of the State Board of Trade—gives 1,102 pounds. The product of this orchard sold, picked, for 2½

cents a pound. This orchard has seventy trees to the acre. Other prune land just as good is to be found in other districts of the county. The climate of Tulare is unequalled for drying all kinds of fruits. A large area of the county is devoted to raisin grapes. The most profitable vineyards are in the Lucerne district, in the western part of the county north of Tulare Lake. The foothill coves and valleys around Porterville and vicinity present a cultivable area of 500 square miles, and are especially adapted to the production of oranges, lemons, limes, and olives. The oranges of this locality have taken many prizes in the citrus fairs. The lemons are admitted to be as fine as grown in the State. The already large acreage of citrus fruits is being rapidly added to, and doubtless in a few years citrus fruits will rank among the most valuable products of the county. The acreage in fruit is 22,076—bearing, 15,442; not bearing, 6,634. Of this, prunes have 5,121 acres; peaches, 3,800; raisin grapes, 10,264; apricots, 724; pears, 642; oranges, 571; lemons, 63; olives, 320; figs, 182; nectarines, 128; plums, 89; apples, 147.

Stock Raising.—Stock raising is one of the most important and remunerative industries of the county. On all the ranches are to be found the finest strains of roadsters and draft horses, beef and dairy cattle, sheep, and swine. Tulare seems to be the banner county for hogs, and its wool clip is very large. Alfalfa is the secret of all this. The Assessor reports for 1892: Horses, 22,501; cattle, 25,868; hogs, 15,346; mules, 1,488; sheep, 190,406; goats, 1,759; poultry, 1,478 dozen.

Timber.—The vast forests of the Sierra, of sugar and yellow pine, spruce, fir, and cedar are almost untouched. There are numerous large saw mills in the mountains, and the product is carried by flumes to the railroad, but the field is virtually unexploited.

Minerals.—There are a few quartz claims, mostly in the vicinity of White River, where a few small mills find steady employment. The great altitude and the inaccessible nature of the claims are the principal drawbacks. Slate, marble, coal, plumbago, gold, silver, iron, copper, lead, and antimony are known to exist in large deposits. This field will be reached some day, and richly repay the development.

Transportation.—The Southern Pacific Railroad has three lines in the county—the main line north and south, a branch from Fresno on the north, via Porterville, to Poso on the south, and a branch from Goshen through Hanford to Huron and Alcalde in the Coast Range. Two small branches run from Goshen and from Tulare City to Visalia. Strong hopes of a canal to reach the San Joaquin River are entertained, to give cheap water transportation to San Francisco.

Prices of Land.—In the vicinity of the leading towns unimproved fruit lands can be bought for \$50 to \$150 an acre, with ample irrigation supply; at a greater distance from towns, from \$25 to \$50 an acre. Grain lands are variously held at from \$25 to \$100, according to fertility and location. Pasture lands in the mountains range from \$5 to \$20 an acre.

TUOLUMNE.

Tuolumne County is bounded on the north by Alpine and Calaveras Counties, east by Mono, south by Mariposa, and west by Stanislaus and Calaveras.

Statistics.—Area, 1,953 square miles, or 1,349,920 acres. Unentered Government land, 700,000 acres. Lands assessed, 336,830 acres. Total assessed valuation of all property, \$3,144,990. Rate of taxation, State and county, 1.70. Number of miles of railroad, none. County property, \$38,000. County debt, none. Number of schools, 40. School children between 5 and 17 years, 1,474. School money, \$27,493 37. Population, census of 1890, 6,028.

County Seat and Principal Towns.—Sonora, the county seat, population 1,441, has five churches, good schools, three newspapers, electric light plant run by water power, planing mill, two flour mills, and a fruit cannery. Columbia has a planing mill, flour mills, box factory, fruit drier, three churches, and good schools. The Columbia marble works were reopened last year. Other towns are Chinese Camp and Big Oak Flat. These towns are remote from railroad connections; all intercourse with the outside world is by team and staging, consequently their growth is slow, being due to local demands only and to the mines.

Topography.—The county extends from the lower foothills in the west to an altitude of 14,000 feet at the summit of the Sierra on the east. The famous Hetchy Hetchy

Valley, a rival of Yosemite, is in the eastern part of the county. The western slopes are covered with timber. The county is watered by the three branches of the Stanislaus River in the north, and by the Tuolumne River, with its branches, through the southern part, furnishing magnificent water power. There are many beautiful lakes in the mountains. The western foothills and the narrow valleys along the streams furnish the only tillable soil, which is very rich and productive.

Climate.—In the lower foothills, about Sonora, the temperature reaches about 95° in July and August, and occasionally 100°. The winters are cool, with occasional frosty nights and light falls of snow. In the high mountains an alpine climate prevails.

Irrigation.—The water ditches and flume amount to 137 miles, built originally and mainly for mining purposes, but useful for irrigation.

Agriculture.—Grains are raised only for the local markets, but the yield per acre is heavy. All kinds of vegetables grow profusely, and there is a plentiful supply for home use. Tomatoes, corn, potatoes, onions, lettuce, radishes, beets, turnips, peas, beans, cabbage, etc., are found in all gardens in the favored spots. The Assessor reports for 1892: Wheat, 3,900 acres; oats, 600; barley, 2,000; hay, 1,200. Alfalfa grows well in the narrow valleys along streams.

Horticulture.—There are 655 acres of fruit trees and vines in the county—519 bearing and 136 not bearing—as follows: apples, 268 acres; peaches, 97; pears, 68; raisin and table grapes, 75; cherries, 28; apricots, 27; figs, 18; walnuts, 13; almonds, 8; plums, 5; oranges, 5; lemons, 2. The citrus fruits are successfully grown in sheltered sections. Mountain apples are of first quality, and bring \$20 a ton. Railroad facilities would vastly extend the growth of fruits.

Stock Raising.—Stock is raised to some extent in this county. The feed ranges are excellent, and have pure water and abundant shade. The Assessor reports for 1892: Horses, 2,404; cattle, 8,125; hogs, 1,000; mules, 110; sheep, 7,300; goats, 100; poultry, 1,000 dozen.

Timber.—The mountains have a belt from north to south of the most magnificent sugar pine in the State, which will cut 50,000 feet to the acre, worth in San Francisco \$60 a thousand. Some of these trees will go 16 feet in diameter, and 100 feet to the first limb. This timber has scarcely been touched. Immense quantities of yellow pine, fir, spruce, and cedar are intermixed with this. These lands can be bought for \$15 an acre. There are over 300 giant sequoias in the South Grove, near the Calaveras line.

Mining.—Gold mining is reviving, and much foreign capital is now being invested, new mines prospected, and old mines reopened. Much money has been spent the past year, and no section of California mines offers better inducements for investment. The principal mining sections are Columbia, Sonora, Big Oak Flat, and Chinese Camp.

Prices of Land.—Land is cheap in this county, and much Government land can be obtained.

VENTURA.

Ventura County is bounded on the north by Kern and San Luis Obispo Counties, east by Los Angeles, west by Santa Barbara, and south by the Pacific Ocean.

Statistics.—Area, 1,682 square miles, or 1,076,480 acres. Unentered Government land, 500,000 acres. Lands assessed, 527,054 acres. Total assessed valuation of all property, \$8,253,341. Rate of taxation, State and county, 1.65. Number of miles of railroad, 54.50; assessed at \$509,619. County property, \$105,000. County debt, \$11,000. Number of schools, 64. School children between 5 and 17 years, 3,148. School money, \$66,831 34. Population, census of 1890, 10,066.

County Seat and Principal Towns.—San Buenaventura, the county seat, 83 miles from Los Angeles, population (1890) 2,320, has increased, in common with other towns, about 25 per cent since that date. Its location is on gently sloping land, by the ocean, with low hills at the rear, and sheltered from rough winds by mountains in the distance. It is provided with elegant county buildings, new banks, electric lights, electric street car lines, a large ice factory, elegant churches and schools, two first-class hotels, and substantial business blocks. A company is incorporated to run an electric railway to the famous Ojai Valley, a distance of 12 miles, and part of the track is already laid. There is considerable manufacturing, and a large amount of produce is shipped by coast steamers. A beautiful avenue is laid out along the banks of the Ventura River.

Santa Paula, a rapidly growing town, population (1890) 1,047, has a bank, good hotel and business buildings, newspaper, planing and flour mills, and two oil refineries, which pipe the oil from the wells and to the ocean at San Buenaventura and at Hueneme, where it is loaded in tank ships and taken to San Francisco. The output of oil is about 1,000 barrels a day. New wells and new territory have been developed, and the outlook is very flattering. This industry and the extreme productiveness of the grain and fruit farms have given a new impulse to all these places.

Hueneme, population (1890) 789, is one of the most important shipping places on the southern coast, especially of grain and beans. Saticoy, New Jerusalem, Montalvo, Nordhoff, Fillmore, Camulos, and other places are alike progressive and prosperous.

Topography.—About one half of this county is arable land and very fertile, needing irrigation in many places to insure productiveness. The mountains are mostly low and timbered, except in the north, where the range running east and west rises to over 6,000 feet. The valleys are fertile, the principal of which are the Santa Clara; Camulos, the alleged home of the "Ramona" of Helen Hunt Jackson; Ojai, with its well-timbered basin of productive soil, heavy in wheat and favorable for orange culture; Conejo, on the northern slope of Guadalupe Mountains, well watered and productive of grain; Simi, with splendid oak forests and grazing lands; Santa Ana, with cultivated farms and orchards; Las Posas, with immense wheat fields and semi-tropic fruits; Sespe, and San Buenaventura. The Santa Clara River traverses the county from northeast to southwest, with its tributaries, the Santa Paula, Sespe, and Piru. The Ventura rises in the San Rafael range and flows due south to the sea.

Soils.—All these valleys possess a rich, inexhaustible loam from 10 to 150 feet deep, varying in quality somewhat, but all alike fertile.

Climate.—On the coast the temperature seldom goes below 34°, nor rises above 83°. In the interior valleys it is hotter in summer and colder in winter. The climate in general is extremely delightful. Snow comes on the high mountains, but never in the valleys. The average rainfall is about the same as Santa Barbara County, 17 inches.

Irrigation.—The county has enough natural water to supply all its lands. There are in use now about 25 miles of ditch for irrigation. By irrigation the best results in fruits and vegetables can be secured. Little irrigation is practiced, however, yet products of every description are raised in abundance.

Agriculture.—Wheat and barley are largely produced. More beans are raised than in all other sections of California. This crop was over \$1,000,000 last year. The annual product of lima beans is estimated at 30,000 tons. There is one bean field of over 2,000 acres. These bean crops are produced without irrigation. Barley is estimated at 700,000 centals. There are no Assessor's returns for 1892 on acreage sown.

Horticulture.—In fruit raising this county stands high in capacity, and if behind in production, it is due to isolation from market, rather than to any indifference among its people. All deciduous and sub-tropical fruits, nuts, and olives are produced in abundance. Some of the finest lemons in the State are marketed from this county, at Santa Paula and Sespe. The English walnut grows to perfection in this county. It is also the natural home of the apricot and the prune. Oranges are as bright, sweet, and as richly colored as those of Riverside. Figs are produced in profusion. Many limes are successfully grown—almost a tropical product. There is one of the finest lemon orchards in the State at Santa Paula, which returns large profits to its owner. There are 11,155 acres of fruit trees and vines in the county—3,397 bearing and 7,758 not bearing, which latter item shows the recent growth of the fruit industry. Walnuts lead, with 6,305 acres, of which 5,308 are not in bearing. Next in order come apricots, prunes, peaches, oranges, lemons, apples, nectarines, pears, table and raisin grapes, and almonds. There are 45,000 orange trees, one half in bearing.

Stock Raising.—The Assessor's report for 1892 shows 8,335 horses, 14,179 cattle, 3,860 hogs, 286 mules, 35,354 sheep, 106 goats, and 1,921 dozen poultry.

Honey.—There are over 10,000 hives in the county. Honey is collected every month in the year. The annual product is not far from 3,000,000 pounds. The bees collect honey, all the year, from the abundant blossoms of alfolleria, shrubs, and wild flowers in the mountains and foothill valleys.

Minerals.—Both placer and quartz gold deposits exist in the Piru district. Asphaltum, bituminous rock, limestone, marble, and brownstone are found. Much of the

latter is shipped abroad, and is used largely in various cities. There are fifty producing oil wells in Ventura, some of them flowing. This county is the leading petroleum district of the State. Last year's product is not reported; that of 1891 was 270,133 barrels. The present output is about 1,200 barrels a day. The oils are both lubricating and illuminating.

Places of Resort.—The entire coast region is delightful in climate, as well as many of the interior valleys. Nordhoff is a famous resort for invalids, in the charming Ojai Valley. "The Avenue" is a beautiful drive lined with shade trees, extending up the valley of the Ventura. The Ojai Valley will soon have an electric road running 12 miles out from San Buenaventura.

Prices of Land.—Prices of land in this county are not reported to us, but it is to be presumed that they are reasonably low, as much remains to be improved, and the county should be a most favorable place for investment, pending the completion of the Southern Pacific line south to Santa Barbara in the next eighteen months, supplying the last link in the coast route between San Francisco and Los Angeles.

YOLO.

Yolo County is bounded on the north by Colusa County, east by Sutter and Sacramento, south by Solano, and west by Lake and Napa.

Statistics.—Area, 1,017 square miles, or 650,880 acres. Unentered Government land, about 15,000 acres. Lands assessed, 524,277 acres. Total assessed valuation of all property, \$21,086,490. Rate of taxation, State and county, 1.10. Number of miles of railroad, 87.80; assessed at \$1,005,921. County property, \$78,000. County debt, \$51,355 77. Number of schools, 78. School children between 5 and 17 years, 3,478. School money, \$89,315 09. Population, census of 1890, 12,684.

County Seat and Principal Towns.—Woodland, the county seat, with a population of 4,000, is reputed one of the wealthiest cities for its population in the State. Its private residences are elegant and costly, and its hotels first class. No less than fifty residences have been built during the past year. Its streets are wide, clean, and lined with ornamental trees. Some of them are paved with bituminous rock. The city has floated \$135,000 of bonds for sewerage, a City Hall, and waterworks extension, and these improvements are now in course of construction, as well as an incandescent light system. The city is now well lighted with gas and electricity, and has efficient street car service, fire department, telephone, express, and telegraph service. It is connected by rail with Marysville, Sacramento, and San Francisco, California, and Portland, Oregon, and will soon have rail service up the famous Capay Valley. Its opera house is one of the best in Northern California, and its public and business buildings are costly and elegant. There are here a free library, improved grounds and track of District Fair Association, three substantial banks, efficient city government, low taxes and low water rates, pure water, salubrious climate, excellent sanitary conditions, and a very low rate of mortality. It has two first-class daily newspapers and one weekly. As a city with all of these advantages, besides being liberally provided with first-class schools, two colleges, elegant houses of worship, and public society buildings, it presents unusual attractions to those who are seeking new homes.

Winters, on Putah Creek, in the heart of a splendid fruit section, is a thriving town with a bank, newspaper, hotels, and fine public and business buildings.

Davisville, on the main line of the California Pacific, in the center of a large grain and fruit district, shows all evidences of thrift, enterprise, and prosperity. Other important towns are Dunnigans, Blacks, and Knight's Landing, in the grain regions of the northern part of the county; Clarksburg, in the rich garden region of the Sacramento River, and Rumsey, Capay, Madison, Surrey, Guinda, and Esparto in Capay Valley.

Topography.—Yolo County is washed on the eastern boundary by the Sacramento River; on the west sheltered by the Coast Range. Two important streams, Putah Creek on the south, and Cache Creek on the north, cross it from west to east, till lost in the marshes bordering the Sacramento River. They both have many feeders. The latter rises in Clear Lake, in Lake County, and flows through the fertile Capay Valley. The greater portion of the county is level, except in the western part, where rise the foothills of the Coast Range, which are intersected by cañons and valleys. The tule lands along

the Sacramento contain about 40,000 acres. There is but little waste land in the county. Capay Valley is about 25 miles long and 4 miles wide on an average. It is traversed by the Vaca Valley and Clear Lake Railroad, which will eventually be extended into Lake County. This valley is one of the finest early fruit sections in the State, and especially adapted to "intensified farming." Its scenery is of fascinating beauty, exciting the admiration of every lover of nature.

Soils.—In the possession of deep alluvial soil of the highest fertility Yolo ranks among the choice places of California. This is alike true of Capay Valley, Woodland, Winters, and the Sacramento region. Closer to the western foothills it is more gravelly.

Climate.—During July and August the mercury frequently exceeds 100°. Frosts sometimes occur in the early winter months, but rarely severe. In Capay Valley the climate is mild and pleasant all fall, winter, and spring. While the summer shows many warm days, the nights are cool and remarkably free from dew. The air is pure, clear, light, and dry, and the climate is one of the best for those having weak lungs. The average annual rainfall for Woodland is 17.25 inches.

Irrigation.—Clear Lake, for which Cache Creek is the outlet, has a catchment area of 420 square miles, and the total watershed of the creek is 1,024 square miles. Its elevation is 1,300 feet above sea-level. In flood stages the discharge of water is over 30,000 cubic feet per second. The minimum discharge in October is 40 cubic feet per second. With a proper system of restraining works, reservoirs, and canals, this stream could furnish enough water to irrigate all the arable lands of the county. The Moore ditch irrigates about 15,000 acres, mainly devoted to alfalfa. There are about 90 miles of irrigating ditch in the county. It is estimated that Clear Lake would furnish 50,000 horsepower. The question of controlling its waters, under the Wright Act, is being agitated.

Agriculture.—Yolo is a large wheat producer, and doubtless will long continue to be so. The chief wheat districts are in the northern and eastern portions, for which Dunnigans and Blacks are the center. Woodland and Davisville also handle immense quantities of grain. Alfalfa is a large crop along the lowlands, paralleling the Sacramento, where immense growth is made, no irrigation being required on these moist lands. Clarksburg ships large quantities of vegetables and melons by steamer to San Francisco. The country adjacent is as rich as the delta of the Nile. The Assessor reports for 1892, 198,043 acres in wheat, 17,870 in barley, and 12,200 in hay.

Horticulture.—While Yolo County has not such extensive plantings as some other counties, she is adapted by soil, climate, and location to the successful production of a large range of varieties of fruits, and is justly entitled to become one of the leading fruit sections of the State. There are 12,817 acres of trees and table and raisin grapes, of which 10,000 are bearing and 2,817 not bearing. The varieties range as follows: Raisin grapes, 6,350 acres; table grapes, 1,800; prunes, 1,522; peaches, 1,040; apricots, 824; pears, 621; almonds, 499; figs, 68; cherries and apples, each, 25; olives, 23; plums, 15; oranges, 5. The principal fruit districts are Putah Creek, from Winters up to and through the Capay Valley, and all the country bordering the Sacramento from Davisville north through Woodland to the northern limits of the county. The main product is raisins, in which industry the county was the pioneer in California. The largest vineyard under one ownership is 1,200 acres. In Capay Valley extensive plantings have been made in the past year or so. Prunes do as well as anywhere in the State, peaches thrive, and the Bartlett pear is of excellent quality and large yield. When Capay Valley comes into full bearing, the superiority of its soil and location for fruit culture will be fully acknowledged. The fruit of the county is marketed in Sacramento and Marysville canneries, or shipped green or dried to the East and to San Francisco. We have no figures at hand for the shipments of 1892, but the total was very large. There are also 2,400 acres of wine grapes in the county.

Stock Raising.—There is a large amount of stock kept in the reclaimed tule lands along the Sacramento River, where feed is abundant the year round. Dairying is extensively carried on, and this district supplies thousands of gallons of milk daily to the city of Sacramento, as well as beef, mutton, and pork. The entire tule region, protected by immense levees and abounding in green feed, is a favorite pasturing ground for large quantities of stock, which are often driven there from other localities. The Assessor's report for 1892 shows: Horses, 8,765; cattle, 13,466; hogs, 7,230; mules, 3,719; sheep, 44,915; poultry, 2,810 dozen.

Prices of Land.—Prices of land in Yolo County may seem high, but they are not when the immense productiveness of the soil is considered, and the exceptional facilities for marketing products. The successful colonies established in Capay Valley during the past two years demonstrate the advantage of settling in a community with like purposes and aims, seeking unitedly improvement and development in one direction. Lands can be obtained on easy terms, even with no payment down, and with low rates of interest, provided certain just conditions of planting and improvement are complied with. Under such a system the owner can, if industrious and saving, pay for his land out of its products within a few years. California affords no more attractive field for fruit culture than Yolo County offers to the industrious colonist.

YUBA.

Yuba County is bounded on the north by Butte County, east by Nevada and Sierra, south by Placer, and west by Sutter.

Statistics.—Area, 617 square miles, or 394,880 acres. Unentered Government land, 30,000 acres. Lands assessed, 322,942 acres. Total assessed valuation of all property, \$7,194,308. Rate of taxation, State and county, 1.80. Number of miles of railroad, 28.34; assessed at \$339,793. County property, \$58,000. County debt, \$81,600. Number of schools, 52. School children between 5 and 17 years, 2,144. School money, \$43,359 58. Population, census of 1890, 9,550.

County Seat and Principal Towns.—Marysville, the county seat, population 4,000, is located on the Oregon and California Railroad, at the junction of Yuba and Feather Rivers. It is a terminal railroad shipping point to and from the East, at the same rates with Stockton, Sacramento, San José, and San Francisco. It has water transportation by river to Sacramento and San Francisco. Many factories and wholesale houses are located here, notably woolen mills, flour mills, foundries, iron pipe and tank factories, agricultural implement works, and extensive fruit canneries, and a large trade is carried on with many interior points. It has two banks, two newspapers, college, high school, fine public buildings, and an energetic and enterprising population.

Wheatland has a bank, flour mills, two newspapers, fine schools and churches, and does a thriving business as the center of a highly fertile section. Other important towns are Smartsville, Camptonville, Brownsville, Strawberry Valley, etc.

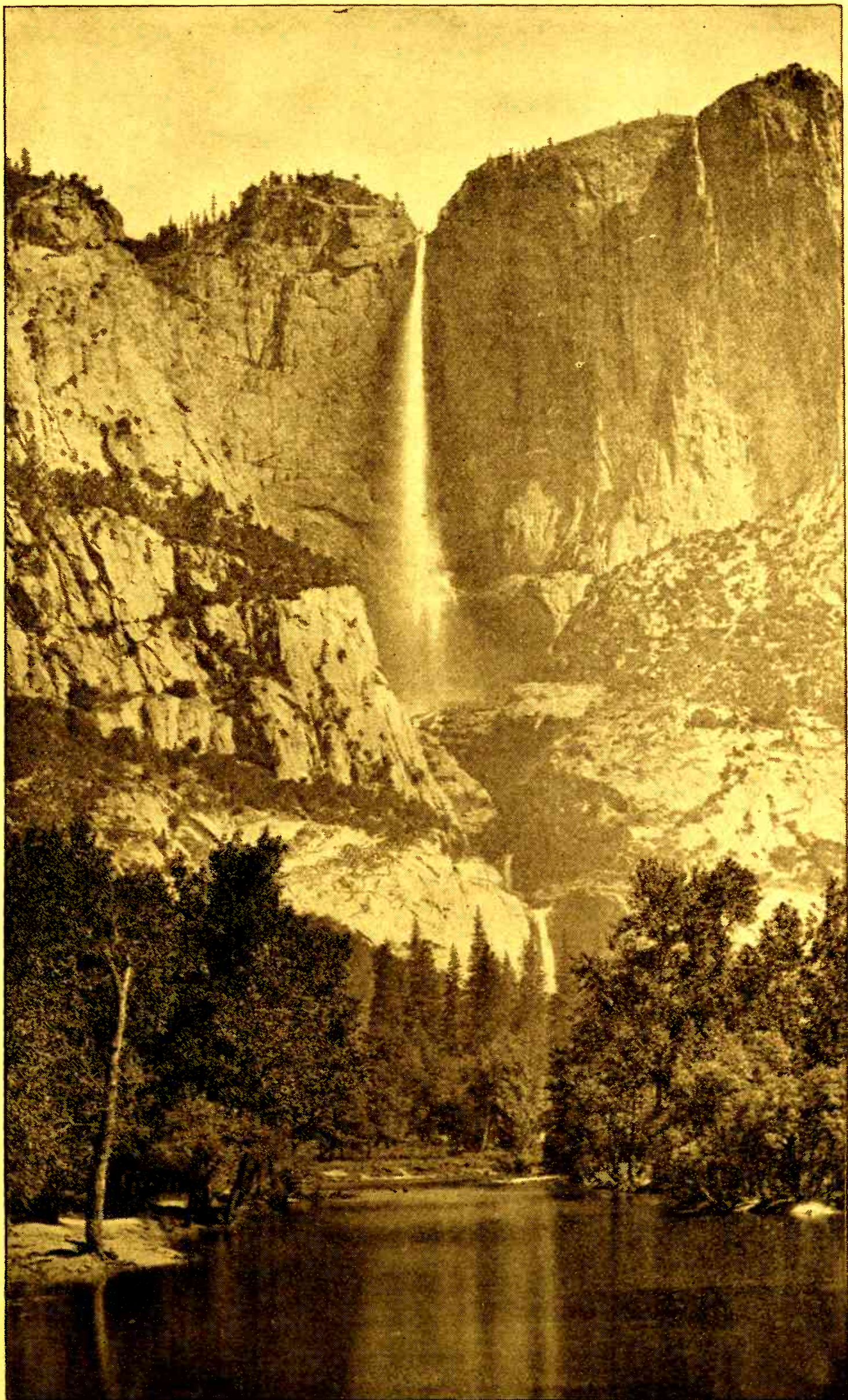
Topography.—The southwestern portion is valley land containing about 100,000 acres; the central foothill section has 136,000 acres, while there are 200,000 acres of mountain land. The county is abundantly watered by the Bear, Yuba, and Feather Rivers.

Soils.—The valley lands are deep, rich alluvial soil, entirely free from rocks and gravel. While these are mainly devoted to grain, alfalfa, and vegetables, they are excellent for fruits and vines, and many acres of orchard and vineyard are located in this section, as fine as any to be found in the State. There is no overestimating the extreme productiveness of this valley soil. The foothill region, formerly considered valueless, has been demonstrated to be excellent fruit land, and has long been devoted to fruit culture, the results having raised the market value of these lands to \$100 an acre, where twenty years ago Government prices would have been considered high. The soil generally in the latter section is red, pebbly clay.

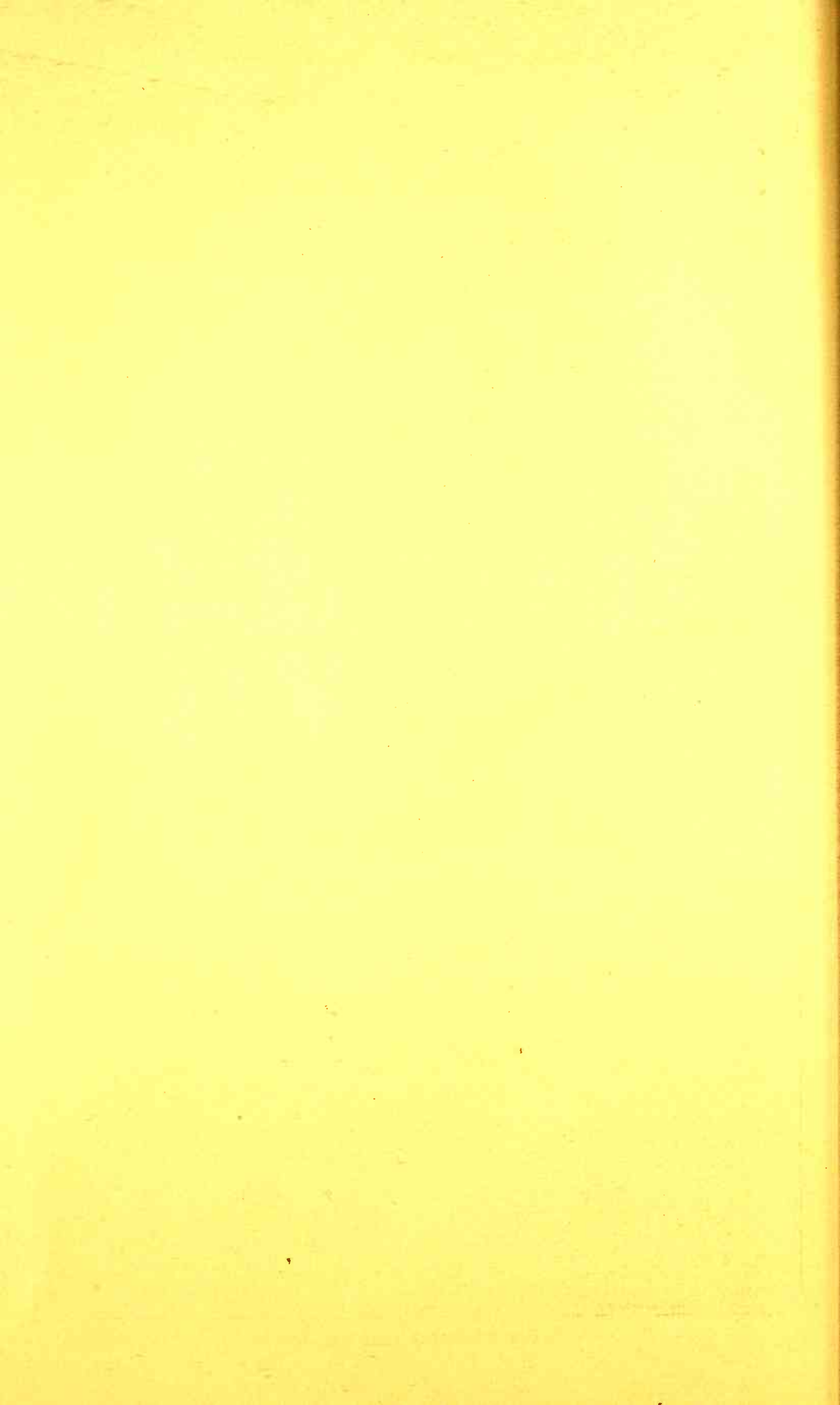
Climate.—Yuba, like many of its sister counties adjoining, has hot summer days in July and August, the mercury at times passing the 100° mark, but the evenings and nights and mornings are invariably cool. The winter temperature occasionally drops below the frost line. The average summer range is from 75° to 90°, and of winter between 40° and 50°. The annual rainfall in the valley is between 18 and 20 inches.

Irrigation.—The lands of the valley plains, devoted mainly to cereals, where crop failures are unknown and the yield very high, require, and use no irrigation, except seepage and pumping from the rivers where vegetables and alfalfa are extensively grown. There are, however, a half dozen irrigating ditches, covering 75,000 acres, and furnishing abundant water, principally in the Browns Valley irrigation district.

Agriculture.—No separate figures for this county are at hand showing production of cereals, but the joint wheat crop of Yuba and Sutter Counties amounts to 140,000 tons annually, on the average. In the low alluvial lands around Marysville and Wheatland, and along the rivers, large crops of alfalfa and hops are grown which cannot be excelled



YOSEMITE FALLS, 2,634 feet high.



for yield anywhere in the State. Many tons of potatoes, tomatoes, corn, and all other vegetables are raised for the general market. The Assessor reports for 1892, wheat, 21,247 acres; oats, 4,651; barley, 8,414; corn, 640; hay, 10,131.

Horticulture.—In the wide range of adaptability of the soil and climate to fruit culture, Yuba is not inferior to any of her southern sister counties. The range of fruits embraces lemons, limes, pomelos, loquats, persimmons, olives, citrons, pomegranates, almonds, walnuts, chestnuts, as well as all the deciduous fruits, with peaches in the lead. The abundance of fruit production in this and the neighboring county of Sutter justified the establishment of the Marysville cannery to handle surplus products, the success of which institution has been very flattering; 2,000 tons of canned goods are turned out annually. Its output finds large markets in the East, in England, and in South America. During the season 450 hands are employed and \$50,000 paid in wages. The fruit crop handled in the county in 1892 exceeded 4,500,000 pounds. Much was marketed green by the carload to the Eastern States. Oranges and lemons have been successfully grown in the county for many years. The prices obtained for fruits in 1892 were: apples, 1 to 2½ cents per pound; apricots, 1½ to 2½; cherries, 4 to 10; figs, 3 to 4; peaches, 2½; prunes, 2½ to 2¾; almonds, 12; walnuts, 8 to 9; grapes, 1¼ to 3½. There are 2,005 acres of orchard and vineyard—987 bearing and 1,018 not bearing.

Stock Raising.—That stock raising is remunerative in this county is proved by the Assessor's figures for 1892, which give 5,004 horses, 8,215 cattle, 3,613 hogs, 516 mules, 29,025 sheep, 232 Angora goats, and 1,026 dozen poultry. The Marysville Woolen Mills consume annually 750,000 pounds of wool, in tweeds, flannels, and blankets.

Timber.—There is a large tract of valuable timber in the northeastern part of the county, and a number of large saw mills among them. Difficulty of access has thus far prevented any great amount of development.

Mining.—Extensive placer and hydraulic claims in this county yielded millions of gold in early days, and doubtless the deposits are not yet worked out, though mining has nearly ceased, owing to litigation relating to the deposit of detritus. The principal mining section is around Smartsville, Camptonville, Brownsville, and Strawberry Valley. Quartz mining is receiving attention in the eastern part of the county.

Prices of Land.—Lands can be bought of private parties at reasonable rates and on easy terms, and a number of colony tracts are offered in small subdivisions of 10 acres and upwards, with water for irrigation, and on easy terms.

THREE NEW COUNTIES.

At the last session of the Legislature the formation of three new counties was authorized. Since the description of counties was written the electors of the new districts voted in favor of the formation of the counties, named respectively Kings, Madera, and Riverside. Nothing more than a brief description can be given.

KINGS.

This county is formed of the western portion of Tulare County, including the "Mussel Slough" country, or Lucerne district, great in raisins, and the Tulare Lake. Its area is 561 square miles, or 359,000 acres, has an assessed property valuation of \$7,523,485, and a population of 7,900. Its established irrigation system is one of the best in the State. Hanford is the county seat.

MADERA.

This county will absorb all of Fresno County north of the San Joaquin River, about 100 miles from east to west, and 25 miles wide. Its area is 2,100 square miles, or 1,344,000 acres, with a population of about 8,000 and an assessed valuation of \$7,500,000. Madera, with a population of 1,800, located near the county center, will be the county seat. This new county includes numerous prosperous colonies and some of the richest land in the State.

RIVERSIDE.

This county is formed of segregated portions of San Bernardino and San Diego Counties, extending across the State from the ocean to the Colorado River. San Bernardino surrenders 590 square miles, and San Diego 6,418 square miles to form the new county. San Bernardino parts with the rich valleys and foothills of the southwest

section, including the towns of Riverside, South Riverside, Allessandro, Beaumont, and Banning. San Diego loses the district embracing Elsinore, San Jacinto, Winchester, Murietta, and Fallbrook. The new county appropriates \$8,700,000 of San Bernardino assessment, and \$3,849,114 of San Diego, making a total assessed valuation of \$12,549,114. The county is rich, progressive, abounds in natural resources, and has on foot large irrigation schemes to bring extensive tracts of its fertile soil under cultivation. Its prospects for material advancement are of the brightest. Riverside is the county seat.

TOPOGRAPHY OF THE STATE.

Condensed from an article by T. C. JUDKINS, of World's Fair Commission.

In its topography California includes the highest as well as the lowest land in the United States; valleys, the most beautiful and productive; deserts, dry and barren; elevated regions, where the rainfall is so great as to keep the slopes comparatively drenched; depressed spots, where from year to year hardly a cloud flecks the sky; mountains, steep, rugged, and alpine in their glacial fields of ice and snow; plains, on which neither snow nor ice is known; wide bays, magnificent views, picturesque lakes, the highest waterfalls in the world, the oldest forests, and the tallest trees.

Speaking in general, California is a parallelogram extending northwest and southeast, from latitude $32^{\circ} 50'$ to 42° north, a total length of about 800 miles, and an average width of about 200 miles. In area it is the second in size in the Union, containing 158,360 square miles, or more than two and one half times the combined area of all the New England States. If California were transferred to the shores of the Atlantic, her coast-line would extend from Boston, Mass., to Savannah, Ga.

The two mountain ranges of the State exert an important influence upon its climate, which is here less a question of latitude than of altitude and distance from the sea. They start from a common origin, and run southerly for over 500 miles, to unite again at Tehachapi. Gradually separating they widen to a distance of 140 miles from summit to summit.

The main range, the Sierra Nevada (saw-notched snowy), forms the eastern boundary of the State, and varies in general altitude from 5,000 to 8,000 feet; it has 43 mountain peaks, among the highest of which are Mount Shasta, 14,511 feet high, and Mount Whitney, 15,860 feet, the highest mountain in the United States. Lake Tahoe and Yosemite Valley are among the other most distinguished features of the range. Along the western slope is the famous warm fruit belt, averaging 12 miles wide, within the limits of 300 and 1,500 feet altitude, and stretching from Shasta to Kern County.

The Coast Range, which follows the sea line and comprises a number of subordinate ranges, extends the entire length of the State. It varies from 2,000 to 6,000 feet in height and from 20 to 40 miles in width, the summit of the range averaging probably 50 miles from the ocean. In this range are many valleys, some large, some small, but all exceedingly productive, and with the exception of those in the extreme southern portion of State, irrigation therein is not necessary to produce horticultural products.

The northern part of the State above Redding is mountainous, being formed by the junction of the Coast Range and the Sierra Nevada. It has many fertile valleys and wide plateaus. In the southern part of the State the Coast and Nevada ranges meet and break up into many ranges, having distinct names. The main body begins at the west line of Santa Barbara County and trends east and southeast. On the southern slope are sunny valleys, rolling hills, and mesas, which constitute Southern California.

VALLEYS OF CALIFORNIA.

Of the 158,360 square miles, or 101,450,400 acres, in California, it is estimated that about one third, or 35,000,000 acres, can be readily brought under cultivation. The one great valley system of California lies between the Sierra and Coast ranges of mountains, but is popularly divided into two valleys, the Sacramento and the San Joaquin, the names being given them from the rivers that form their principal drainage.

The San Joaquin Valley extends from the southern extremity in Kern County to the mouth of the San Joaquin River, nearly east of San Francisco, 240 miles long, with an average width of 45 miles. It contains about 11,000 square miles, or 7,000,000 acres.

The Sacramento Valley, the second largest in the State, is about 160 miles long, and extends from Red Bluff on the north to the mouth of the Sacramento River at junction with the San Joaquin, and averages about 40 miles wide, and contains about 6,200 square miles, or 4,000,000 acres. It is an unbroken plain, except where the Marysville Buttes rise in Sutter County to a height of 2,000 feet.

Besides these two great valleys innumerable smaller ones are found in both the Coast and Sierra Nevada ranges. These are usually well watered and exceedingly fertile, and are found at altitudes varying from ocean-level to 8,000 feet or more of elevation, and varying in area from a few acres to miles in extent.

The Santa Clara Valley is one of the most important in the State, both in size and fertility. It opens on San Francisco Bay, where it has a width of 20 miles, and extends in a southerly direction for about 70 miles, its southern end narrowing to a mile or less in width.

North of San Francisco and opening on the waters of the harbor are Sonoma and Napa Valleys, each having a series of smaller valleys tributary thereto, and all being exceedingly fertile. Vaca and Capay Valleys, opening into the Sacramento Valley from its western side, are small, but noted for early fruits.

In the northern portion of the State, Eel River and Hoopa Valleys, of the Klamath and Trinity Rivers, Scott Valley, in Siskiyou County, Surprise and Round Valleys, in Modoc County, and Honey Lake Valley, in Lassen County, vary in length from 30 to 60 miles, and in width from 2 to 20 miles, the soil in general being deep and rich. From Plumas County a series of fruitful valleys stretches for 100 miles southeastward into Sierra County. In Alameda and Contra Costa Counties are several valleys of great fertility, their nearness to the San Francisco market making them particularly desirable. The Alameda Valley, extending for many miles eastward from Oakland, contains a belt of excellent fruit land.

The Salinas Valley heads in San Luis Obispo County, runs north 100 miles, empties into Monterey Bay, and is from 5 to 15 miles wide. The Santa Clara, in Ventura County, the Santa Maria, in Santa Barbara County, and the Arroyo Grande, in San Luis Obispo County, are all notable valleys.

South of the Tehachapi Mountains, which are formed by the junction of the Sierra Nevada and Coast Range, and included in the counties of Los Angeles, Santa Barbara, San Bernardino, Orange, Riverside, and San Diego, are some of the most important and fruitful valleys in the State. The region is subdivided into the Los Angeles and San Bernardino plains, the chief agricultural region of the southern portion of the State, and the rolling hills, mesas, or table lands, and small valleys of San Diego.

The Los Angeles and San Bernardino plains extend westward to the ocean, and along the coast for about 65 miles, being broken by a small range known as the Riente Hills. Antelope Valley lies in the northeastern portion of Los Angeles County, and opens toward the Mojave Desert.

The San Jacinto plains extend from San Bernardino County southward into San Diego County, and form an extensive area, somewhat level in general character, but interspersed with numerous buttes. The western portion of San Diego County is covered with rolling hills and mountains, which are often bisected with numerous small valleys, both the mesas and the valleys being exceedingly productive.

In the southeastern portion of the State is an immense plateau, beginning on the southern boundary line and extending northwestward through the eastern portions of San Diego, San Bernardino, Los Angeles, and Kern Counties, and over the greater portion of Inyo County. This region is known as the Mojave and Colorado Deserts, is about 200 miles long and 100 wide, contains about 20,000 square miles, and lies at an elevation of 2,000 feet above the sea. It is destitute of vegetation, but responds to irrigation.

BAYS AND HARBORS.

The coast-line of California, which is 850 miles in length, or 1,200 miles following the shore, is studded with numerous roadsteads, bays, river entrances, and sheltered land-

ings that furnish opportunity for a safe and cheap coastwise trade, besides possessing two harbors suitable for the largest vessels and at least two more that admit vessels of 16 feet draught.

San Francisco Bay is the finest harbor on the coast of the two Americas, and one of the finest and safest of the world. The Golden Gate, its entrance, is about one mile wide, but the bay broadens rapidly, and forms a series of bays, having an area of 450 square miles, or 288,000 acres. San Francisco Bay proper extends 30 miles south and 10 miles north. Adjoining on the north is San Pablo Bay, 12 miles in length, connecting with Suisun Bay, of still greater length. There is about 30 feet of water on the bar at low tide, with an increase of two to ten times that depth farther up the bay. This harbor possesses all the requirements for a great commercial port—safety, commodiousness, and capacity.

San Diego Bay, 500 miles south of San Francisco, and only 10 miles north of the Mexican boundary, is 14 miles long and from 1 to 2 miles wide, forming a harbor of great commercial value, the second in importance in the State. There is a depth of 21 feet on the bar at low tide, but inside the channel the water is much deeper.

Humboldt Bay, 200 miles north of San Francisco, is 14 miles long from north to south, and has an average width of 3 miles, and a tidal area of 45 square miles. The depth of water on the bar at the entrance varies from 9 to 22 feet, but the Government is now constructing a series of jetties that will increase the depth.

San Pedro Bay, 24 miles south of Los Angeles, has in Wilmington Harbor an artificial seaport that, with the aid of the Government, is being converted into a safe anchorage for deep-sea vessels. Vessels drawing 12 feet of water now enter at low tide, and those drawing 16 to 18 feet at high tide.

Redondo Beach and the bay at Santa Monica, ports of Los Angeles County, both form harbors that with money and engineering skill can be made suitable for the reception of deep-water vessels.

At Santa Barbara and Port Harford there are good anchorages, except during storms from the south.

RIVERS OF CALIFORNIA.

The Sacramento and the San Joaquin Rivers are the arteries of the State. The former heads in the northern portion of the State and flows southward, draining the great Sacramento Valley. The latter heads in the Sierra Nevada range well to the southward, and flows northward, draining the larger portion of the San Joaquin Valley. The rivers meet and empty into Suisun Bay, at a point about 35 miles due northeast of San Francisco. Both are navigable streams.

The Klamath River, in the northern portion of the State, is large and important, especially on account of the large watershed that it drains, but it is not navigable. Eel and Russian Rivers are the two next most important streams that empty into the Pacific Ocean north of San Francisco.

Pitt, Fall, McCloud, Feather, Yuba, Bear, and American Rivers are the chief tributaries of the Sacramento River. The Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, and Fresno Rivers are leading tributaries of the San Joaquin River, all having their sources in the Sierra Nevada range.

The streams in the central portion of the State that rise in the Sierra, such as Kings, Kaweah, Tule, and Kern Rivers, find their outlet in Tulare Lake. In their course, however, their waters have been gradually diverted for purposes of irrigation, and have changed what were once considered arid plains into lands among the most fruitful in California, or even in the world. The Mojave River rises in the northern slope of the San Bernardino Mountains, in San Bernardino County, but after flowing a short distance sinks into the Mojave Desert.

Southward from San Francisco is the Salinas River, 100 miles long, which empties into Monterey Bay, and along the coast are many small but important streams that have their sources in the Coast Range and empty into the ocean.

In Southern California there are a number of rivers, too numerous to mention, that are comparatively torrents in winter and dry beds in summer, but which are of incalculable value to their several districts, as they supply ample water for irrigation, which is the life-blood of the present citrus fruit center of the State.

LAKES, BEAUTIFUL AND USEFUL.

In size, beauty, and importance, the lakes of California differ as widely as the climate of the valley regions differs from that on the summits of the Sierra. The total area of the lakes in the State is approximately given at 2,380 square miles, or 1,500,000 acres. Lake Tahoe, in Placer and El Dorado Counties, is one of the most beautiful bodies of water in the world; its elevation is 6,247 feet above the sea, is 22 miles long, 10 miles wide, and half a mile in depth. In Modoc County are three salt lakes covering 64,000 acres. Goose, Rhett, Clear, Klamath, and Donner Lakes have large areas. Lassen County has twenty-two permanent lakes, with an area of 94,000 acres; the largest are Honey and Eagle Lakes, covering 27,000 acres. Clear Lake, in Lake County, is a picturesque lake, 25 miles long and 8 miles wide. Mono and Owens Lakes are on the eastern slope of the Sierra. Tulare Lake, in Tulare County, is the largest lake in the State, having an original area of 160,000 acres, but now somewhat lessened. In the southern counties of the State there are a number of lakes, but they are small in comparison to the bodies named. The soil about the lakes is generally fertile; the waters, except that of Owens and Mono, and the salt lakes of Modoc, are of crystalline purity, and abound with fish. The Coast and Sierra ranges boast of hundreds of gem-like lakes that give an added charm to scenic features, yet they all, together with the larger lakes, possess a high utilitarian value from the important influence they directly and indirectly exert upon the water systems of the State, and therefore upon many of its most important industries.

CLIMATE OF CALIFORNIA, AND ITS ECONOMIC VALUE.

By GEN. N. P. CHIPMAN, of Red Bluff.

The economic value of climate is not measured by temperature alone. If this were not true, we would only have to consult the readings of the thermometer, and wherever we found like temperatures would also be found like economic results. For example, Florida, which shows a mean maximum and minimum temperature about the same as in the low altitudes of California, does not produce the prune or the raisin, nor, indeed, but few of the wide range of fruits grown here. The soft and delicious atmosphere of the south of Italy, where minimum temperatures are about the same as in California, does not give the tiller of the soil nearly so many advantages as are found here.

In judging of climate, there is nothing so misleading and inconclusive as tables of mean annual temperatures. For example, the mean annual temperature of San Francisco, where there is seldom a frost and rarely a hot day, is only about 5° higher than the mean temperature of New York City, where people perish in the street both by extreme cold and heat. It is obvious that mean temperatures convey but a slight idea of actual climatic conditions, and do not necessarily imply either high or low temperatures in summer and winter.

It does not much concern the intending settler what the causes of existing climates may be, so long as they are constant and likely to be permanent. If he can find a climate to suit him that is determined by fixed laws and unchanging physical conditions, he is not curious to search farther.

Nevertheless, I will as briefly as possible state some of the distinguishing features of California's climate, and the chief causes that are generally stated as producing the conditions existing here. I shall deal with the subject in an entirely untechnical way, and as the facts impress an ordinary observer. We have three distinct climatic belts or zones—a climate of the higher or mountain altitudes, a climate of the interior low altitudes, or valleys, and a climate of the seacoast. These in turn have their modifications as to localities, but retain their leading features.

The Siskiyou Mountains (height, 8,000 feet) connect the Coast Range on the north with the Sierra Nevada range, which latter forms a high wall extending along the east boundary of the State well toward its southern boundary. This lofty battlement on the north and east has much to do in warding off the arctic currents and deflecting them

from the lower valleys. There are large areas of mountain valleys in this region of rich and fertile soil. In the northeastern portion of the State there is a very large country practically unoccupied. The elevation is from 3,500 to 4,500 feet above the sea. The summers are nearly rainless and the winters mild, with occasional cold days when the thermometer goes down to and sometimes below zero. In places higher in the mountains heavy snow is experienced, which diminishes, however, as one goes east from the high altitudes. The summers are delightful. Hardy fruits, grains, and the grasses all flourish in many of these valleys. When lines of transportation reach these regions the country will be sought by many, because more nearly resembling the climate and country to which they are accustomed, but with much less of its rigor.

The interior valleys of the Sacramento and San Joaquin lie along the base and west of the Sierra, and extend from Shasta County, latitude corresponding with New York City on the Atlantic, to Kern County, in latitude corresponding with Wilmington, North Carolina. Here the Tehachapi Mountains rise up and connect the Coast Range with the Sierra. South of the Tehachapi is the region known as Southern California. The Sierra range has an average altitude of 6,000 feet, with many spurs and peaks extending to more than twice that height. The Coast Range is higher toward the north than in the south boundary of the State. It has a height west of the upper Sacramento Valley of 4,000 feet, diminishing as it goes south. This range is also an important factor in affecting the climate of the interior valleys, by shutting off the cool sea breezes of summer, as well as the modifying winds of winter. For example, the ocean breezes of summer that blow almost constantly from the ocean toward the shore are not felt directly in the Sacramento Valley, except as they enter at the Golden Gate and follow up or down that valley and into the San Joaquin Valley. At Monterey these breezes reach into the interior some distance and give a cool summer climate, but the Coast Range shuts them off from the Fresno and Tulare and Kern County region, and there the summer climate is hot, as it is also for like reason in the upper Sacramento Valley. Again, this Coast Range breaks into low altitudes south of Tehachapi, and the cool breezes are carried far inland at Los Angeles and south of that point.

Latitude and declination of the sun north or south of the equator seem not to be essential factors of climate here, as elsewhere. For example, the line of 25° above zero, minimum temperature, enters the Sacramento Valley at Redding, in latitude corresponding with New York City, and runs through this valley and through the San Joaquin and past Riverside, 550 miles south, and enters Mexico, and emerges at Wilmington, North Carolina, on the Atlantic.

The chief modifier of our climate is the Japan, or great equatorial ocean current, which is deflected northerly and easterly when it meets the east coast of Asia. A portion of this warm current flows northwest, washing the east shore of China and Japan. Near latitude 50° and longitude 170° it divides, one portion continuing northerly through Bering Strait, and the other south of the Aleutian Islands. It advances eastward until it strikes the northwest coast of North America, then turns acutely to the southeast, flows along the west shore, and past California and Mexico, and is drawn again into the equatorial current near the Tropic of Cancer, and takes up its circuit of a quarter of a hemisphere. Of the constancy of this factor there can be no doubt, although it has not been so long or so deeply studied as the currents of the Atlantic. Professor Davidson, however, has done much to enlighten us on the subject. He has found this current to start with a maximum temperature of 88° . At Alaska it is found to be 50.06° . Eight hundred miles west of San Francisco it is 60.33° . One hundred miles west it is 55.05° . At Fort Point the mean for eight years was 55.66° , while the temperature of the air was 54.97° . Nine hundred miles west of San Francisco the mean temperature of the water for one year was 60.52° . This shows the current far out at sea to be about 4° warmer than that near the shore, and that the Japan Current loses about 22° of its heat in the circuit to a point off our coast. We have, then, a body of water explored for 1,000 miles in width, flowing past our shores constantly, of an average temperature of 57.89° . Observation shows also an air current flowing from this surface that rarely rises more than 2° or 3° above the temperature of the water. There is a great aerial current that moves with the ocean stream, and is the counter trade-wind of the northern hemisphere, and largely determines the climate of California. This air current oscillates from the south of west at one portion of the year to north

of west at the other, moving measurably with the sun's declension, and, singularly enough, giving a more balmy and agreeable climate in the winter than in summer on the immediate coast. But this coast climate varies but little throughout the year. At San Diego, same latitude as Charleston, South Carolina, the climate is 8° cooler. San Francisco and Washington, D. C., are in the same latitude and have the same mean temperature, but a wholly dissimilar climate, because of the great difference between the winter and summer—at Washington amounting to 40°, while at San Francisco it is not over 8°.

It has been observed that whatever may be the cause of the wind in the forenoon, it almost invariably works around and blows from the west in the spring, summer, and autumn months, and of course across the mild Japan Current. An intelligent observer (Dr. Gibbons) found that for seven months, from April to October, inclusive, there were but three days (and these were rainy in April) in which this phenomenon was not noticed. If it were not for the Coast Range, interposed between our great valleys and the ocean, we would have our present coast climate far into the interior and up the slopes of the Sierra. As it is, the ocean breezes find their way through every opening and over the low altitudes of this range, and greatly influence many places.

In Southern California the Coast Range is low, and offers but little resistance to the ocean current, and the effect is felt many miles inland. The heat of the valleys modifies the harsher ocean winds and gives a balminess to the atmosphere that has given to Southern California a world-wide reputation as a sanitarium, and has made it the home of our tropical and sub-tropical fruits. The characteristic features of the coast climate are cool summers and mild winters, and abundant rainfall, this latter diminishing as we go south.

Among the assigned causes of this constant draught of the ocean air current is the fact that to the east lie the Colorado, Mojave, and Nevada Deserts, which are great reservoirs of heat. Each day, as the sun rises over this vast area, the sands become heated, the temperature of the air increases, the air rises, and the cooler currents of the ocean atmosphere rush landward to fill the vacancy.

The interior or valley climate is characterized by mild winters, warm summers (with occasional hot days), and less rainfall than on the coast, and diminishing from north to south, as on the coast. In all parts of the State our summers are practically rainless—on the coast, in the mountains, and in the valleys—from the middle of May or June 1st to the middle of October or November 1st.

Coming into the interior we find that temperatures are practically the same in the foothills to an elevation of 1,500 to 2,000 feet, with this difference, that the nights are cooler at the higher elevations, and the rainfall is greater by about one inch to each 100 feet. This further difference is also noticeable: the temperature of the valley is carried farther up the mountain as we go south. For example, if the temperature of Redding (the extreme north of Sacramento Valley) is carried up 2,000 feet, at Bakersfield or Sumner (the extreme south of the San Joaquin Valley) it would be carried up 3,000 feet approximately.

A glance at the map will show the trend of the east coast of the United States to be sharply from west to east. The east coast of Florida is west of a line drawn north through Pittsburg, or is about 600 miles west of Boston. The west coast of California at San Diego is about 40° longitude, while the west coast of Alaska is about 98°, or nearly 3,000 miles farther west. San Diego is nearly 400 miles east of Cape Mendocino. The arctic north winds that sweep across our continent find no obstruction on the Atlantic Coast, and often reach far south and into Florida. On the Pacific Coast they are carried out to sea, or, if they are deflected down the coast, are modified by the Japan Current before they reach California; or they are arrested and deflected eastward by the great mountain barrier stretching from the southern boundary of the State far into Alaska, in an unbroken and ragged wall from 70 to 100 miles in width, and from 1 to 2 miles in height. There are many charming small valleys and nooks found in the Coast Range that have neither the coast climate nor the interior valley climate. The Santa Clara, Napa, Sonoma, Livermore, and other valleys are examples. They have the advantages of both climates to some degree, and less of the disadvantages of either. I am not permitted space to point these out or to go into greater detail. Location with reference to the sea and the mountain ranges determines these advantages.

The characteristic features of the interior valleys, as already noted, are warm and rainless summers, dry atmosphere, rain in winter months and moderately cold, with a minimum temperature rarely reaching 20° above zero, and generally about 48° mean winter temperature. The dryness of the atmosphere makes outdoor labor, when the thermometer marks even 100° or 110°, entirely comfortable. This high register, however, is not common. The nights are almost uniformly pleasant and agreeable, and assure refreshing sleep.

Some general facts as to the agricultural products will illustrate the interior valleys:

	When Sowed.	When Matures.
Wheat-----	October and November (summer-fallow)-----	July.
Wheat-----	December and January (winter-sown)-----	July.
Barley-----	December and January-----	June and July.
Oats-----	January and February-----	June and July.
Corn-----	February and March-----	June to August.
Beans-----	February and March-----	May to July.
Peas-----	February and March-----	April to June.
Tomatoes-----	February and March-----	May to July.
	Bloom.	Mature.
Apricots-----	March-----	May to July.
Peaches-----	March-----	May to November.
Pears-----	April-----	June to October.
Apples-----	April-----	June to November.
Oranges-----	April-----	December to March.
Cherries-----	March and April-----	May to July.
Almonds-----	January to March-----	October.
Plums and prunes-----	March-----	June to October.

In many portions of Southern California and along the coast garden vegetables are grown throughout the year, and hardy vegetables are growing every month in all the interior valleys, except in the mountains.

The grain farmer, for summer-fallow crop, plows his land in the spring; it lies fallow till October or November, when he sows it; he next, after rain comes, plows for winter-sowed grain, which should be sowed by January, although we make good crops sometimes by sowing as late as March in good soil. Harvest season begins in May and June for hay, and in June and July for grain, and continues to August. The grain is cut and stacked, and afterwards threshed, or is threshed as it is cut. It may be left in the field without fear of rain.

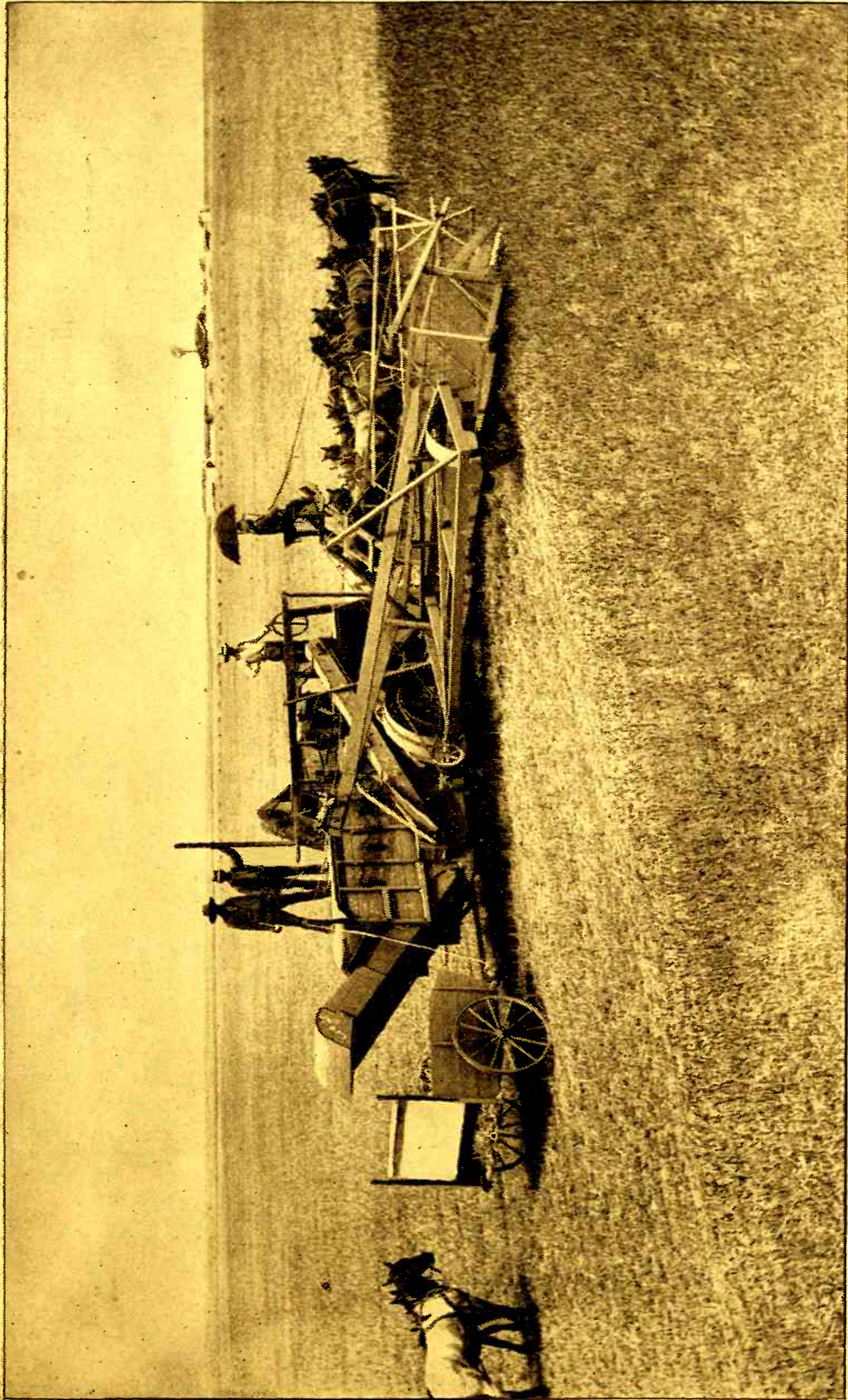
The fruit grower plows and plants trees soon after the rainy season—in December or January; he prunes his trees in November and December, or later; he plows his orchard in January or February, and replows and cultivates until June or July. His early fruits begin to come in by May, and are followed almost continuously by successive varieties of other fruits until November, when late pears are gathered.

In November and December olives are ready for the pickle and press, and in January, February, March, and April our oranges are marketed, thus making the round of the year, and every month yielding its return of some kinds of fruit. The orange ripens a month earlier in Northern California than in Southern California. The fruit grower, it will be seen, has no day when work is not before him. The season between the last fruit picking and the work for the next year is scarcely long enough to repair tools, clean up packing houses, and prepare for the new year.

It may be stated generally that the climate is milder in Southern California than in Northern California. The minimum temperature is lower north than south, and the maximum higher. This is true both on the coast and in the interior.

I come now to a brief statement of the economic value of this phenomenal climate. There are many ways to illustrate this value.

As a sanitarium, California will always present unusual attractions. The healthfulness of all parts of the State, and in all our distinctive climatic belts, is remarked by all



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who come here. I am not speaking of the country for invalids, however, but call attention to the fact that people from the East and West who come here to reside experience renewed vigor and life wherever they settle. It is an erroneous idea, sometimes entertained, that the mild climate of California begets that lassitude and indisposition to labor so common to tropical climates. We engage here indoors and outdoors in all the occupations found in the temperate zone, in the field, workshop, and factory, and with all the zest and ambition that distinguish the American people elsewhere.

Another result of great economic value is that every day in the year is a comfortable working day. This cannot fail to impress industrious and frugal people who wish to utilize their capital, which lies largely in daily earnings. Considering our agricultural interest broadly, there is no dormant or idle season, or a period when consumption eats away production, as in countries where severe cold paralyzes productive effort for half the year. I am not speaking of what some farmers do in California, but of what all farmers may do in California. Intelligent, diversified agriculture admits of no necessarily idle day, and no day without the possibility of adding the productive value of a day's work.

If we turn to factories or the workshop, we find the same true. Less fuel, less clothing, uninterrupted work for the year, and greater comfort result from an equable temperature. I have often heard thoughtless persons speak of California as no place for the poor man. It is the reflex of the early bonanza days, and is born of that dangerous notion that success is measured only by rapidly acquired riches. I assert unhesitatingly that there is no more inviting country on the globe for the industrious poor. Every condition existing here refutes the false idea that only the rich may prosper.

This volume, issued under the authority of the State, is designed to show the world only facts easily verified by proofs to be found in the Exposition grounds at Chicago, and especially in the California Building. I invite the reader to consult these evidences rather than meteorological tables. There will be found, exhibited by various counties from Shasta to San Diego, every fruit of every zone—the cereals, the citrus family, the hardy apple, the date palm—not all in commercial quantities, but grown in unprotected and open grounds, subjected to all the changing seasons of the year, and quite enough to certify our absolute immunity from extreme cold or great or intolerable heat. Why should there be need of consulting climatic charts or tables with these proofs before our eyes?

Let me illustrate the practical value of climate and soil where so great a range of the fruits of the earth is possible. In 1880 we shipped East, in all forms, 546 carloads of fruit. In 1892, this export industry reached 20,000 carloads, and of these 9,000 cars were green deciduous fruits, nuts, and oranges, at least a part of each of which went from a region 700 miles long, north and south. Prunes, figs, raisins, almonds, walnuts, nectarines, peaches, pears, apples, olives, plums, apricots, oranges, lemons, cherries, have gone to market from a single orchard that may be named 600 miles north of San Diego. California fruits are known by the tasting as far as in London, England, but it is not known that they are grown and shipped from so widely separated regions of the State.

It is the climatic conditions found here that make these things possible, and it is remarkable, but true, that all these conditions cannot be found elsewhere in any one place on the globe.

Looking forward to the immense importance of this industry, it must not be forgotten that our climate gives the keeping quality found in our fruits; that our rainless season and dry summer atmosphere make the open air a natural dry house; that the precocity of our trees gives us profitable orchards after four years from planting, and that there is great certainty of yield and great longevity to the trees. These are all economic factors in our climate and give to it great value.

It will possibly astonish some, but it is true, that the beautiful orange groves of Southern California and the magnificent deciduous orchards of the north occupy land formerly devoted to wheat or used for grazing purposes. The world-renowned Fresno raisin vineyards were many of them sheep-walks in other days. Climate alone made the transformation possible. The prune orchards of Santa Clara Valley are of recent production. The economic value of our climate was not discovered in that charming valley until her land owners planted trees instead of wheat.

But a country that can do all these things has no limit, except such as the conditions themselves place upon it. Vegetable growing and market gardening belong logically to this climate, and already are rapidly developing. The rapid improvement in and cheapening of transportation, and the possibilities of refrigeration as an aid in shipping, will bring this wonderful orchard and garden of America to the very doors, economically speaking, of the world's consumers.

It would seem to be quite superfluous to append to this paper tables of temperatures throughout the State. The reports of the Agricultural Department, containing the records of the Weather Bureau, have brought to the public attention the facts in great detail, and are within reach of all. It is now possible to know the exact truth as to all parts of the State from entirely reliable data.

The purpose of this article is to satisfy the inquiry generally made, What are the distinguishing features of the California climate, and what is its economic value compared with other climates of our country? If I have reasonably answered this inquiry I have done all that was asked of me.

Sergeant James A. Barwick, of the United States Weather Bureau, has for several years made annual reports to the State Board of Agriculture upon the meteorology and climatology of California. These reports cover all parts of the State and every phase of our climate, and are rich in data and generalizations. I have drawn from these reports, and refer to them as containing detailed information upon every possible question that may be asked relating to California climate.

CLIMATE AND CLIMATIC FEATURES OF CALIFORNIA.

By JAMES A. BARWICK, Observer United States Weather Bureau and Director of the California Weather Service.

The limit of space assigned to this subject precludes the discussion of the physical causes of the climatic features of California. It is enough to state the facts, leaving to the intending settler the choice of a home in either of the climates of the State.

California is a territory of such magnificent extent, such marvelous wealth of soil, such variety and grandeur of scenery, such perfection of climate, and is so free from all those annoyances that disturb humanity in other parts of the world, that the Californian wonders why the whole people of the East do not at once migrate hither.

People in the East do not comprehend the extent of California, to say nothing of its climate and productions. California is more than a State; it is a principality in itself. For instance, compare the area in square miles of the following States with that of California: New York, 49,170; Pennsylvania, 45,215; Michigan, 58,915; Connecticut, 4,990; total area, in square miles, of the four States, 158,290, with 217 counties; California's area, in square miles, 158,360, with 57 counties; California's excess over those four States, 70 square miles. California is 770 miles long; extreme breadth, 330 miles; least breadth, 150 miles, with a coast-line of over 1,280 miles. If California were transplanted on the Atlantic coast, the coast-line would reach from Boston, Massachusetts, to Savannah, Georgia.

These comparisons illustrate the difficulty and almost impossibility of giving to Eastern visitors an intelligent idea of either the climatic features or the vast resources of California.

The latitude of Fort Jones, Siskiyou County, on the north, is 42°, being the same as Boston, on the Atlantic coast. San Diego, in the south, is in latitude 32°, the same as Savannah, in the East. The mean winter and summer temperature at Savannah is 53° and 81°, while San Diego boasts of a mean winter and summer temperature of 54° and 68°. Fort Jones has a mean summer temperature of 69°, the same as Boston; the latter's mean winter temperature is 28°, while Fort Jones—elevation, 3,000 feet above sea-level—has a mean winter temperature of 34°—6° warmer than Boston. Monterey's mean winter and summer temperature is 52° and 64°. Richmond's mean winter and summer temperature is 75° and 37°. Sacramento's mean winter and summer temperature is 49°

and 74°, as against 33° and 73° at Baltimore. Mean winter and summer temperature of San Francisco, 51° and 60°, as against 36° and 70° at Washington, D. C. Mean winter and summer temperature of Los Angeles, 54° and 70°, as against 48° and 80° at Atlanta, Georgia. Santa Barbara has a mean winter and summer temperature of 53° and 68°, as against 43° and 76° at Raleigh, North Carolina. The places named in the East and used as a comparison with California points, are situated on the same line of latitude. In some corresponding lines of latitude, where in the East snow would cover the ground, we would have open, mild weather, with flowers blooming the winter through.

There is no State in the Union, no country upon the continent, no section of country in any State, nor geographical division of the continent, that can compare with California in salubrity of climate, healthfulness, variety of pleasing shadings of climate, or attractive and health-giving summer and winter resorts. In December we have the sun shining a great number of days; the air is balmy, with people upon the streets in attire that could be worn in the East only in early summer or autumn. Winter in California is but summer without its hot days.

In all of California, and particularly along the coast, the winters are comparatively warm and the summers comparatively cool. This is due to the prevailing winds, which in winter come from the south and in summer from the north. The climate of California varies according to the longitude and altitude. Two factors enter into the formation of our climate: the Pacific Ocean, from which the winds coming through the Golden Gate bring moisture, and the Sierra Nevada Mountains, which cause the precipitation of the moisture.

The isothermal lines are, as they near the coast, so deflected as to run north and south, and mark out three climatic belts, which are the coast, valley, and mountain. The valley belt, beyond the Coast Range, commencing with Shasta Valley on the north, extends down through the Sacramento and San Joaquin Valleys, into the arid plains of the Mojave and Colorado Deserts; while the mountain includes the Sierra Nevada beyond. Rainless summers characterize all these regions. To these three climates may be added a fourth, to wit: Southern California, which includes so much of California as lies south of the junction of the Coast Range and the Sierra Nevada Mountains.

COAST CLIMATE.

This climate is confined to that portion of California which "looks out upon the sea" from Point Conception, in Santa Barbara County, to the north line of the State. The annual temperature ranges from 45° to 60°. The climate puts one into an agreeable state of invigoration, and there is a sense of buoyancy and vitality experienced in no other climate.

The therapeutical effect of this climate, says Dr. John W. Robertson, is essentially tonic, and suited only to certain classes of invalids. That its healthfulness is mainly due to the wind cannot be doubted. This wind, besides possessing moisture and coolness, is surcharged with ozone, and much of its influence is to be attributed to the oxidizing power of this agent. Persons coming to San Francisco from the interior valleys or the East, are, at first, chilled by the cool, fog-bearing wind, but this chillness soon gives way to a feeling of exaltation and well-being that is almost incapable of being understood by those who have not experienced it.

This climate is susceptible of subdivision; the one just described being directly on the coast, the other more moderate, but of the same type, a few miles inland and protected by the foothills from the full force of the breeze. Such valleys, in close proximity to San Francisco, are the Livermore, Santa Clara, Napa, and Santa Rosa Valleys. In summer the thermometer may register 75° to 85° at midday, but such heat is exceptional. The mornings and afternoons are never sultry; during the winter frosts occur but rarely, and snow and ice are unknown. Still farther inland, in the very heart of the foothills, there is a region which should attract sanitarians by reason of its therapeutic usefulness. Volcanic products are here found in great abundance, and mineral deposits are frequent. Water trickling through these becomes impregnated with various salts, and, emerging as springs, gives them healing qualities. These springs are really scattered all over the State. Hundreds are found throughout the Coast Range; but it is in Central California, in the foothills, that they abound.

CLIMATE OF THE SACRAMENTO AND SAN JOAQUIN VALLEYS.

The Sacramento Valley and the San Joaquin Valley may be said to be one valley, both as to geological and climatic features. From a given point opposite the Golden Gate the heat increases as we go either north or south. From Redding, in the northern end, to Bakersfield, at its southern end, is a distance of three hundred and fifty miles. The mean annual average temperature of Redding is 64°, with an average annual rainfall of 34.60 inches. Bakersfield has a mean temperature of 66°, and an average rainfall of 5.14 inches. Sacramento's mean temperature is 60°, with an average rainfall of 19.53 inches; the latter place being about midway between the places named above.

The average rainfall of the Sacramento Valley ranges from 34 inches at Redding, to 23 inches at Red Bluff, and 19.53 inches at Sacramento. The San Joaquin Valley ranges from 13 inches at Stockton to 9 inches at Fresno, Delano 6.32 inches, and Bakersfield 5.14 inches, showing a rapid falling off in the precipitation of moisture in the San Joaquin Valley as compared with that in the Sacramento. After leaving Bakersfield the rainfall naturally increases on account of elevation in crossing the Tehachapi range of mountains, it being nearly 12 inches at Tehachapi and down to 5 inches at Mojave, on the southern side and edge of the desert.

The heat of these valleys, to the Eastern visitor, in midsummer days, seems oppressive, but to those acclimated presents no objection to continued labor in open air. The dryness of the atmosphere produces rapid evaporation; therefore, laborers in the vineyards and harvest fields are cooled by the rapid evaporation of the perspiration from the body, which in the Eastern climate cannot take place, because the air contains so much moisture that evaporation takes place slowly, a condition which is the cause of the many sunstrokes to persons exposed to the direct rays of the sun while working, and from which we are exempt.

This section is the seat of the great cereal industry of the State, but the equability of the climate is attested by the growth of citrus fruits at both the northern and southern ends of the valleys. Irrigation in the San Joaquin may in time modify the climate somewhat.

THE FOOTHILLS OF THE SIERRA.

The foothills of the Sierra Nevada Mountains, up to a height of about 2,500 feet, have apparently the same temperature as places in the valley in proximity to each other. With increased elevation there is an increase of rainfall over those places in the valley. Sacramento, with an elevation of 35 feet, has an annual mean temperature of 60°, and an average rainfall of 19.53 inches, while Colfax, with an elevation of 2,421 feet, has an average annual temperature of 60°, and an average annual rainfall of 44 inches. This uniformity of temperature and increase of rainfall appears to be the law throughout the whole extent of the foothills of the Sierra, with this variation as relates to temperature, viz.: as latitude is decreased the temperature of the valley is continued to a greater elevation. To illustrate approximately: If the temperature of Redding is continued up the foothills 2,000 feet, then the temperature of Sacramento would be continued up to 2,500 feet, and at Bakersfield up to 3,000 feet. The difference in temperature is so small that the character of the vegetation of the hills at each end of the valley is not dissimilar. The temperature of the valley prevails up the Sierra to an elevation that equals the height of the Coast Range of mountains.

Every agricultural product that can be grown in the valleys, including the semi-tropic fruits, can be grown with equal facility in these foothills. These lands are found to have all the requisites for the successful growth of orchards. Fruit trees thrive better upon them than on the lands of the valley.

SOUTHERN CALIFORNIA.

At Point Conception, in Santa Barbara County, the Pacific coast trends to the east. The Coast Range of mountains, deflecting to the east, joins the southern part of the Sierra Nevada Mountains, and shuts off the cold and northerly winds from the ocean. This section, with the exception of San Bernardino County, has a wide exposure to the sea. The rainfall is very unevenly distributed. Los Angeles has an annual average precipitation of 18 inches, San Bernardino 17 inches, Anaheim 12 inches, Colton and

Riverside 10 inches, San Diego between 9 and 10 inches, Fallbrook 17 inches, Santa Barbara 16 inches, decreasing only a few inches after getting west of the mountains of San Diego and San Bernardino Counties. The coast rainfall is, of course, greater than the interior, except at San Diego. The habitable portion of Southern California receives but a trifle less rain than the lower Sacramento Valley, and more than the San Joaquin Valley. The mean temperature of the principal localities of Southern California is as follows:

STATION.	June, July, August.	December, January, February.
Los Angeles -----	66.1°	50.0°
San Diego -----	63.3	53.0
San Bernardino -----	69.0	49.0
Santa Barbara -----	65.5	58.0

This mild and genial temperature of Southern California is due to low latitudes and ocean winds. Southern California first attracted the attention of sanitarians, and gave California its greatest climatic reputation. The climate speaks so strongly for itself, it is so mild and delightful, that the most caviling cannot find fault, and the invalid susceptible to the slightest chill utters no complaint.

IN GENERAL.

California has but recently attracted the attention of sanitarians. Thousands of invalids here find relief. The climate is beneficial to all diseases affected by change of air. Within its borders are to be found the altitude of the Alps, the scenery of Switzerland, the fruits of the tropics, numerous mineral springs equal in value to and more healthfully situated than are those of the eastern United States or Europe, the pure air of the Colorado highlands, and the winter climate of Florida. The climate of California is much more temperate than that of the Eastern States situated in the same latitude; but this does not hold true of Southern California, where the conditions are reversed: San Diego, in the same latitude as Charleston, is 8° cooler. The mean annual temperature of Santa Barbara is 60°, San Francisco 55°; nor does it fall below this on the northern coast, Crescent City, three hundred miles north, being as mild as San Francisco.

California can boast of more clear days than any known country in the world, except some portions of Arizona, where the arid and cloudless region reigns almost supreme. The Sacramento and San Joaquin Valleys have an average number of clear days, ranging from 240 to 260, and Southern California has from 225 to 270 clear days. The economic value of the climate should be considered. More labor can be performed here within a given time than in any other part of the world; the summer heat does not enervate, while the distribution of the winter rains through four months of the year does not seriously interfere with outdoor life.

NOTE.—*Thermal Belt.*—Mr. T. C. Judkins, of the World's Fair Commission of California, in an article upon the climate of California, says: "There is one phase of California climatology, so important in its effects upon the adaptability of different locations to horticultural products, that it demands special treatment. All through the foothills of the State there exists the so-called 'Thermal Belt.' This comprises a strip of land, circling the hills, at an elevation from 300 to 2,000 feet, in which, notwithstanding the adjacent and lower valleys may be cold and frosty, there is no frost, or certainly not enough to injure the tenderest of sub-tropical fruits. The philosophy of the thermal belt is easily explained. In all parts of the country frosts are mainly restricted to still nights. As the atmosphere cools off, being undisturbed by winds, by a familiar law of atmospheric distribution, the colder stratum gradually but surely rolls down into the valleys, while the warm air of the valley ascends. A difference of 200 or 300 feet in elevation, on a still morning, will often show a difference of 8° or 10° in temperature."

This thermal belt is found in nearly every county, but is most distinctly traced for a longer distance along the slope of the Sierra Nevada Mountains. In this belt may be found the best citrus groves of the south and accounts for the flourishing condition of citrus groves in Tulare, Placer, and Butte Counties in the north. Indeed, as far north as Shasta scattered groups of orange trees are growing.—EDITOR.

EDUCATIONAL ADVANTAGES.

By W. H. V. RAYMOND, Editor of the California State Text-Books.

"What opportunities for education?" is the first question asked by an enlightened householder, when seeking a residence. It is the object of this article to answer the question for California.

IN GENERAL.

Before entering upon particulars, it may be said, first, in general, that the educational system of the State is not the outgrowth of narrow or provincial views, but a system founded in the beginning, and fashioned to the present time, by the sturdiest and most enlightened educational sentiment of the whole country. The best thought and experience of New England, of the great Middle West, and of the South have gone richly into its life and character. The foundation of an incomparable system of primary and grammar schools was early laid by that incarnate enthusiasm from the Granite Hills, John Swett, a national name, as familiar in the educational circles of Boston as in those of San Francisco, where its owner resides. In the directing and inspiring personal agencies which have made the other departments of the California system what they are, the State has been equally fortunate. Higher education, as represented in the State University, has been largely shaped by the classical learning of President Martin Kellogg, from Connecticut and Yale, and by the scientific spirit and eminent scholarship of John and Joseph Le Conte, from the University of Georgia, whose original researches in the departments of physics and geology have given to their names a European as well as an American celebrity. These men stood reverently by at the birth of university education in California, rocked its cradle in infancy, and two of them still remain, keeping step royally with its vigorous manhood. In recent years Leland Stanford, Jr., University, with its endowment of \$20,000,000, and its distinguished President, David Starr Jordan, from Indiana, has brought to this department of education an access of new and abounding life.

The organization and conduct of the State Normal Schools have fallen upon men equally distinguished and equipped for their work. For seventeen years, from 1873 to 1890, the original school was under the direction of Mr. Charles H. Allen, whose normal school work began in Pennsylvania, widened into the principalship of the first Normal School of Wisconsin, and culminated in his distinguished service to the normal school system of California. In 1890 the principalship of this school fell upon its present head, Charles W. Childs, one of its early graduates, a successful author, and a man of marked ability. Ira More, graduating from both the Bridgewater, Mass., Normal School and Yale College—his whole life given to the study of educational science, expanding in Illinois into a four years' professorship in the State Normal School of that State, and in Minnesota into a seven years' principalship of the State Normal School at St. Cloud—has, from its organization, ably directed the fortunes of the State Normal School at Los Angeles. The conscientious and successful organizer and Principal of the school at Chico, the youngest of these schools in California, Edwin T. Pierce, was the gift of Union College and the State Normal School at Albany, New York; and when it is added that the present chief educational officer of the State, Superintendent James W. Anderson, was graduated from Jefferson College, Pennsylvania, and has risen by distinguished success in every grade of work from primary to high school, as teacher, Principal, and Superintendent, it will be seen that our claim to a share in the best educational blood of the whole country is no idle boast.

IN DETAIL.

To the activities of these men and their efficient associates, California is indebted for its completed system of free public education. Among the individual features of that system, enumerated below, the first three are worthy of special attention as vital educational agencies unknown either in form or equivalent to the systems of other States, so far as the writer's knowledge extends. They are agencies whose value is instantly obvious, and which are of the first importance to the citizen, present and prospective.

1. *The financial provision for weak districts.* This is such that nothing but the stupidity and indifference of District Trustees can defeat the intent of the law to maintain a first-class school in the feeblest district of the State for at least eight months of the year. The citizen in the poorest district of the remotest county is assured as good facilities for the education of his children in the primary and grammar grades as the citizen in the rich and thickly settled districts just outside of San Francisco, Sacramento, Oakland, San José, Los Angeles, or other centers of wealth and population. This is accomplished by the State law, which assures to the *smallest* district of the State a sum not less than \$400, to be used *exclusively* for the payment of teachers' salaries; and to the *average* district, whose school is taught by one teacher, at least \$500 is assured for the same purpose, and \$500 is also assured for each additional teacher. Any local district tax that may be levied by the District Trustees is in addition to this. The provision described above is wholly independent of the action of District Trustees or the citizens of a district, and, as will be seen, provides a teacher for eight months in the year, at a salary not less in any case than \$50 per month. No other State in the Union makes a like provision. The result is what might be expected. The common district schools of the State are taught by a highly intelligent, active, enterprising body of men and women. So marked are these characteristics in the teachers of the State, that educational lecturers from other States who meet them in teachers' conventions in California, uniformly speak with enthusiasm of their personal bearing and cultured address.

2. *The provision for academic training and preparation for the two great universities of the State.* It is believed that in no other State is this provision made to reach students in so many parts of the State, or in so large numbers. As in other enlightened States, there are the excellent public high schools of the large cities and towns, provided for by their charters. Of these there are twenty-five with standards so high that graduates from them are admitted, without examination, to the Universities. Three of them are in San Francisco, and one in each of the following cities and towns of the State: Alameda, Berkeley, Fresno, Los Angeles, Martinez, Marysville, National City, Nevada City, Oakland, Pasadena, Petaluma, Riverside, Sacramento, Salinas, San Diego, San José, San Rafael, Santa Cruz, Stockton, Vallejo, Ventura, and Watsonville. Other town high schools, also, are of good rank.

Under this head, however, it is sought especially to emphasize the general provision of law for the establishment of public high schools to connect the small villages and rural districts with the University. This is done by the organization of union high school districts. Under this provision eighteen counties have established high schools, as follows:

Alameda County, 3.	Los Angeles County, 3.	Siskiyou County, 1.
Butte County, 2.	San Bernardino County, 2.	Solano County, 3.
Contra Costa County, 1.	San Diego County, 6.	Sonoma County, 2.
Del Norte County, 1.	San Joaquin County, 1.	Stanislaus County, 1.
El Dorado County, 1.	San Luis Obispo County, 2.	Ventura County, 2.
Fresno County, 2.	Santa Barbara County, 3.	Yolo County, 1.

Thus, nearly forty public high schools bring to the very doors, it may be said, of the tiller of field and farm, the small shopkeeper, and the mechanic who is at once his own contractor and his own journeyman, either a generous academic training or a preparation for university studies. These, with the twenty-five city high schools accepted by the universities as preparatory schools, constitute, it is believed, a provision for secondary education without precedent in any State of equal population.

3. *The compulsory requirement of a fixed expenditure of money, annually, for the support of a district library* is a third educational provision found only in California. This insures to every school district in the State an ample and attractive collection of good books, and is defeasible only by the ignorance, indifference, or dishonesty of District Trustees. The value of this provision can hardly be overestimated. The number of volumes thus accumulated in the district libraries of the State now exceeds half a million.

4. *The preparation and publication by the State of the text-books used in the common schools* is a fourth feature peculiar to the school system of this State. The economical aspect of this feature commends it warmly to the people, and the technical excellence of the books so furnished, in both matter and mechanical construction, is equal to that

of other like standard publications. They may be judged, by those who choose to examine them, in the educational department of the California Building at the Columbian Exposition, where they are submitted for inspection.

5. *Provision for the training of teachers for the public schools*, while not peculiar to California, is generous, and is wisely and jealously managed. Three normal schools are established by the State, and one by the city of San Francisco. The oldest of these is at San José, in the central part of the State, about fifty miles from San Francisco. Twenty-seven instructors are employed in this school, and the attendance of students in the normal classes is between 600 and 700. The buildings and equipments for the practice school, which numbers over 200 pupils, are, perhaps, the most complete in the United States. The second of these schools in age and size is at Los Angeles, in the southern part of the State. In this school the instructors number 14 and the students about 350. Attached is an elegantly appointed gymnasium; and additional buildings are in process of construction. The practice school attendants number nearly 200. The youngest of the schools is in the northern part of the State, at Chico. Instructors, 11; normal students, 200. The practice school has an attendance of 125. This school, like the others, has taken high rank from the start.

6. *Teachers' Institutes*, though maintained in some other States, receive in California exceptional encouragement. Ample funds are provided for maintaining in nearly every county of the State one week of instruction and discussion relative to the best and most fruitful methods of class teaching. It is in these meetings that the stranger notes the high average intelligence of the teachers of the State.

7. *The State University*, for the higher education of both sexes, is located at Berkeley, opposite the entrance to the Golden Gate. It is a source of much pride for the rank it has taken among the great universities of the country, and the people of California have richly and permanently endowed it. It consists of a College of Letters, with three courses leading, respectively, to the degree of A.B., B.L., and Ph.B.; a College of Mining, a College of Mechanics, a College of Agriculture, a College of Civil Engineering, and a College of Chemistry, each leading to the degree of B.S. Besides these are the departments of Philosophy and Pedagogy, at Berkeley, and the affiliated Colleges of Law, Medicine, Pharmacy, and Dentistry, located in San Francisco, and the Lick Astronomical Observatory, on Mount Hamilton. The professors, instructors, and assistants in these colleges number 217, and the students 1,082. University extension courses have been established by the faculty in San Francisco, Oakland, and Los Angeles.

8. *The general administration of the public school system of California*, thus briefly sketched, is in the hands of the following officers: School District Trustees,¹ Town and City Boards of Education,¹ Boards of Education of Union High Schools,² County Superintendents,¹ County Boards of Education,³ Boards of Normal School Trustees,⁴ Board of Regents of the State University,⁴ State Superintendent of Public Instruction,¹ and State Board of Education.²

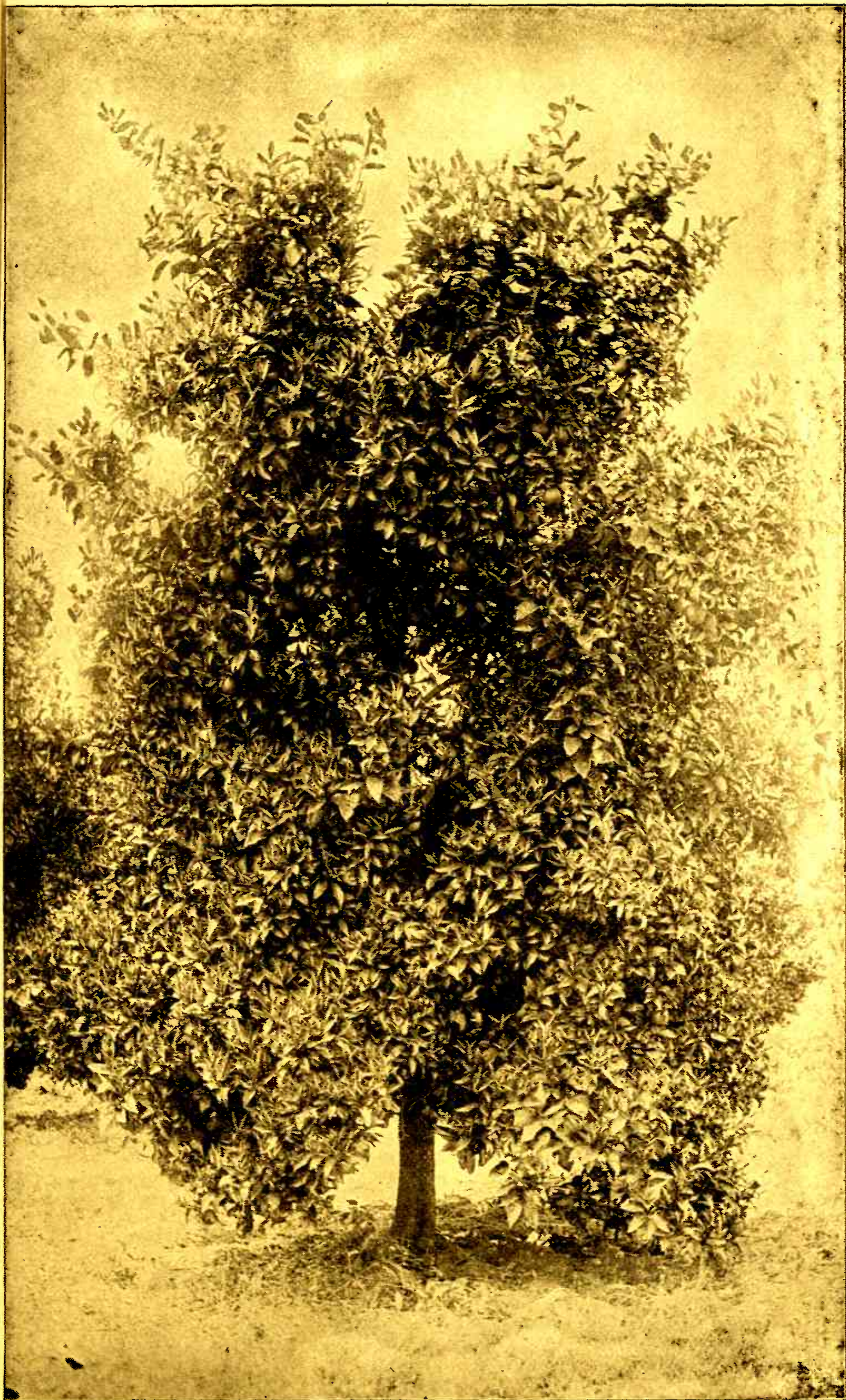
Except in a few of the smaller counties, the entire time of the County Superintendents is employed in service rendered to the schools. The chief duty of the County Board of Education consists in the examination and certification of teachers. The State Superintendent of Public Instruction, in addition to the general supervision exercised by him over the schools, and the collection and publication of detailed information respecting their condition, is charged with the apportionment to counties of State moneys to which they are entitled; the judicial function of interpreting the school law when required by the administrative officers of the same; and is, *ex officio*, a member of the Board of Regents of the State University, of each Board of Normal School Trustees, and of the State Board of Education. The State Board of Education consists of the Governor, the Superintendent of Public Instruction, and the Principals of the State Normal Schools. This Board adopts general rules for the government of public schools; grants term and life diplomas, under statutory restrictions, to applicants for the same; selects the official educational journal of the State; and prepares, or directs the preparation of, the school books published by the State.

1. Elected by the people.

2. *Ex officio*.

3. Appointed by County Supervisors, except the County Superintendent.

4. Partly *ex officio*, and partly appointed by the Governor.



ORANGE TREE—BEARING



In addition to the advantages offered by the public school system of California there are numerous—

9. *Private colleges and academies.* At the head of all these is the great Leland Stanford, Jr., University, at Palo Alto, endowed by Senator Leland Stanford with \$20,000,000. This institution, like the State University, is for the education of both sexes, and, as in that institution, tuition is free. Though now only in the second year of its work, it already ranks with the best. It has a faculty of 78 professors and instructors, and a student attendance of 764, of whom nearly 150 are from other States. Its courses of instruction are distributed through the departments of the Ancient and Modern Languages, History and Political Economy, Mathematics, the Sciences, Philosophy, and Education. Neither Stanford nor the State University has a preparatory department—all the students in both are in college classes proper.

It is not practicable to give a *complete* list of the private colleges and academies of the State. The following list includes the more important, with the county in which they are located: *Alameda County*: Berkeley Gymnasium; Boone's University School; Bowman's Academy; Gilson's Normal Training School; Head's, Miss, School; Hopkins' Academy; Livermore College; Mills College; Our Lady of Lourdes (academy); Sacred Heart (academy); St. Joseph's Academy; St. Joseph's Institute; St. Mary's College; St. Mary's Academy; Snell's Seminary; Washington College.—*Butte County*: Chico Academy.—*Colusa County*: Orland Normal; Pierce Christian College.—*Humboldt County*: Eureka Academy; Sisters of Mercy.—*Inyo County*: Inyo Academy.—*Lake County*: Lakeport Academy.—*Los Angeles County*: Academy of the Immaculate Heart; Pomona College; St. Hilda's School; St. Mary's Academy; St. Vincent's School; Throop University.—*Marin County*: San Rafael Female College; San Rafael School.—*Mendocino County*: Academy of the Sacred Heart.—*Merced County*: Merced Academy.—*Napa County*: Napa College; Oak Mound School.—*Nevada County*: Sisters of Mercy Academy.—*Orange County*: Dominican Sisters' School.—*Placer County*: Sierra Normal College.—*Sacramento County*: Atkinson's Sacramento Business College; Sacramento Institute; Sacramento School of Design; St. Joseph's Academy.—*San Bernardino County*: Bellevue Academy; San Bernardino Academy; Sisters of the Immaculate Heart.—*San Francisco County*: Academy of Immaculate Conception; Academy of St. Rose; Lake's, Miss, School for Girls; Notre Dame Academy; Presentation Convent; Sacred Heart Academy; Sacred Heart College; St. Ignatius College; St. Peter's Academy; St. Rose's Academy; Trinity School; Van Ness Young Ladies' Seminary; West's, Miss, School; Westminster School.—*San Joaquin County*: St. Agnes Academy; St. Patrick's College; San Joaquin Valley College; Stockton Business College.—*San Luis Obispo County*: Boarding and Day School of the Immaculate Heart.—*San Mateo County*: Belmont School; Bishop Armitage Orphanage; Laurel Hall College; St. Matthew's Hall.—*Santa Barbara County*: Franciscan College.—*Santa Clara County*: Academy of Notre Dame; St. Joseph's College; Santa Clara College; Santa Clara Young Ladies' Boarding School; University of the Pacific.—*Santa Cruz County*: School of the Holy Cross.—*Solano County*: Irma Girls' School; St. Catherine's Female Academy; St. Vincent's School; Vacaville Academy.—*Sonoma County*: Pacific Methodist College; St. Vincent's Academy; Santa Rosa Boys' School; Santa Rosa Business College; Santa Rosa Ladies' College; Santa Rosa Seminary.—*Tehama County*: Academy of the Sisters of Mercy.—*Tulare County*: San Joaquin Valley Polytechnic Institute.—*Yolo County*: Hesperian College; Holy Rosary Academy; Woodland Business College.—*Yuba County*: High School for Boys; Notre Dame Academy.

RECAPITULATION.

Briefly summarized, then, the educational advantages of California are seen—

1. In the unprecedented liberality and absolute adequacy of its provision for a good free school, of not less than eight months annually, in every district of the State.
2. In the system which extends high school facilities to every corner of the commonwealth.
3. In the provision for excellent public school libraries in every district of the State.
4. In the economical and admirable provision for the supply of text-books to the pupils of the State.

5. In its generous provision for the instruction and training of teachers in Normal Schools and County Institutes.

6. In the magnificent and richly endowed University at Berkeley, which crowns its educational structure.

7. In the completeness of its machinery for the effective administration, by proper officers, of its whole system.

8. In its University at Palo Alto, made great by private endowment, and in the high character and large numbers of its remaining colleges and private schools.

With these gifts in her hands our beautiful State beckons to the dwellers in her sister States, and to the people of all enlightened nations, inviting them to settlement, citizenship, and home.

AGRICULTURE.

Contributed by T. C. JUDKINS, of World's Fair Commission.

In California both mining and agriculture may be termed discoveries. It was a discovery to find that hundreds of millions of dollars in gold lay treasured in the hillsides and riverbeds of the State, yet it was also a discovery to find that the apparently barren and arid plains possessed soils of such fertility as to soon cause the value of the agricultural products to exceed that of gold. The former was more electrifying in its effects on the world, but the latter resulted in a series of surprises and victories that soon raised California to the rank of one of the very first agricultural States of the Union.

WHEAT RAISING.

Among all the grains, wheat is still king. The total acreage seeded to wheat in the State for 1892 is estimated at 3,000,000 acres, and the total yield, according to the official report of the Department of Agriculture at Washington, at 39,157,000 bushels, valued at \$26,626,000. According to the census of 1890, California ranked fourth as a wheat-producing State, being outranked by Dakota with 40,411,000 bushels, Minnesota with 38,356,000, and Ohio with 29,984,000. California's reported yield that year was 29,121,000 bushels (less than it really was), yet this is only about one half of the largest wheat crop grown in the State, which, in 1880, amounted to 56,916,000 bushels.

For 1892, the Department of Agriculture reports that, in the production of wheat, California ranked fourth in area, second in value of product, and first in price per bushel.

The average annual yield of this State, for the past ten years, has been as follows:

	Bushels.		Bushels.
1883.....	33,500,000	1888.....	31,073,000
1884.....	48,050,000	1889.....	41,958,000
1885.....	25,296,000	1890.....	31,482,000
1886.....	35,657,000	1891.....	35,195,000
1887.....	28,659,000	1892.....	39,157,000

The best California wheat excels in dryness, whiteness of color, and thinness of skin; yet, owing to the difference in soil and climate, the quality of wheat differs greatly in different portions of the State. The interior counties produce white wheats, more starch and less gluten, while the coast counties run to amber wheat—strong, but not so perfect in the color of its flour. The hard wheat, known as "Sonora," is chiefly grown in the upper San Joaquin Valley; Australian wheat in the coast counties. "Chili" wheat is raised chiefly in the northern counties of the San Joaquin Valley and along the extreme southern coast. In the neighborhood of Los Angeles, White Russian and Defiance are the favorite varieties. "The Pride of Butte" and "Club" are grown in the Sacramento Valley and other rich valley lands. The average price of wheat at tide water, for the past ten years, has been \$1 47 per cental, or about 88 cents a bushel. This figure assures the producer a fair margin of profit.

Taken as an average, farms in California are larger than those east of the Rocky Mountains, many of them containing from 5,000 to 10,000 acres and upwards. These farms are gradually being reduced in area. Nearly all the wheat not required for home

consumption is shipped to European markets, about one seventh of the product being manufactured into flour before shipment. Of the total tonnage that visits the port of San Francisco about 50 per cent is required for wheat.

The export trade in both flour and wheat is increasing, much of the flour being consigned to Japan and China. During the year ending June 30, 1892, the exports of wheat from California amounted to 21,550,000 bushels, valued at \$21,843,000; and of flour, 1,055,000 barrels, valued at \$5,194,000, a barrel of flour being taken as an equivalent of 290 pounds of wheat. Of the wheat exported 210,660 bushels were shipped from San Diego and 32,500 bushels from San Pedro, the balance going direct from San Francisco.

There are so many different soils and climates in California that it seems impossible that there should ever be what would approximate an entire failure of the wheat crop. After wet winters the dry lands and hills produce the best crops, and in dry seasons the low, moist lands take the lead. In the great wheat-producing districts it is estimated that the absence of rain during the harvest period is equal to 25 per cent advantage to the California farmer over his Eastern competitor. H. M. LaRue, a conservative agriculturist of Sacramento, states that by the use of the combined harvester, which cuts, threshes, and sacks the grain at the same time, we have been enabled to reduce the cost of harvesting, threshing, and cleaning 60 per cent of what it costs in other countries. Joseph Cone, another large wheat grower in the Sacramento Valley, states that with the improved machinery now in use, the result of cutting, threshing, and sacking is seven and one half acres a day for each man employed, which is a very much higher per cent than in any other wheat-raising country. L. U. Shippee, of Stockton, an experienced wheat grower, says: "First, we have a climate that is wonderfully adapted for the production of wheat. Second, our lands are level, and are cultivated by large gang-plows, from two to eight in a gang, and handled by one man. Third, the machinery used enables the wheat grower to harvest his crop at less than half what it costs in any other State. Fourth, we have no rains in the summer to interfere; we begin harvesting in June and cease in October, and are not compelled to take the grain out of the field until the harvest season is over. No other portion of the wheat-producing zones can do this."

Other advantages may be thus enumerated. Owing to the mildness of the winters wheat can be sown at any time from the first of November to the first of February, or even March. Barns are not used for the storage of grain, nor are they necessary. In the great valleys of the State a stringent no-fence law exists, and the severe tax of building miles of fence for protection of grain is entirely removed. Wheat lands are generally level; the soil is rich, readily worked, and is not easily exhausted. A new-comer can readily rent land on payment to the owner of from one fifth to one third of the crop. The yield will vary according to location and soil. On the rich river bottom lands, the yield is about 40 bushels per acre. In the Sacramento Valley 20 to 30 bushels is considered a fair crop, while in lighter soils that are easily cultivated, and especially those in hot and comparatively dry districts, the yield will vary from 10 to 20 bushels.

The farming of the large wheat districts of California forms a beautiful picture. From 8-horse to 10-horse teams are attached to gang plows, the average being about six 8-inch plows for an 8-horse team. From two to five such teams then follow each other, each team being handled by only one man, and each will plow from 6 to 9 acres a day. In lighter soils, and for spring sowing, a seeder and harrow is often attached to the gang plow and the grain plowed under the ground, being then somewhat leveled by the harrow or drag. The field receives no further attention until the harvest period. The combined harvester cuts a swath from 16 to 30 or 40 feet wide, requiring from 20 to 30 mules or horses, or a traction engine to draw it. Four men usually constitute a crew. From 2 to 2½ acres for every foot of width cut, or from 35 to nearly 100 acres a day, are harvested.

Taking all conditions into consideration, wheat farming in California should form an industry conducive to health and contentment, and when carried on from year to year, productive of large average profits.

BARLEY.

California produces more barley yearly than any other State in the Union, and one fourth of the total amount raised in the United States. This State and New York combined produce one half of the barley crop of the country.

The average barley crop of California is 16,000,000 bushels, but the crop of 1892 is estimated at only 12,333,000 bushels. It is difficult to state the total yield, because barley is used as a food for horses, mules, and hogs to the almost entire exclusion of other grains. The average yield of 16,000,000 bushels is based chiefly on the amount handled at San Francisco, and other seaports in the State, together with the quantity used in brewing.

The soil and climate of California are peculiarly adapted to the growth of barley, the average yield being 30 to 35 bushels per acre. The seed and harvest seasons are about the same as those for wheat. Volunteer crops in California are said to produce larger yields than in any other part of the world, the yield for barley exceeding that for any other grain.

The largest barley-producing county in the State is San Joaquin; San Bernardino ranking second, Merced third, and Contra Costa fourth. The entire San Joaquin Valley is well adapted to barley, as are also the counties south of the Tehachapi range. The counties neighboring San Francisco Bay and those adjacent to the ocean are all large producers of barley, the humidity of the atmosphere of these sections, which is occasionally detrimental to wheat in the way of rust, proving beneficial to the growth of barley.

The Chevalier, or bald barley, is the favorite variety in the bay and coast sections, but elsewhere, including the southern counties of the State, the ordinary bearded grain is almost exclusively grown. The bald barley possesses superior brewing qualities, the demand for this purpose from other parts of the world being large and constantly on the increase.

The exports for the season of 1891-2 are given by the San Francisco Produce Exchange at 1,882,360 bushels. A very large acreage seeded to barley is yearly cut for grain hay, as barley hay makes a superior ration for working horses.

The average price for the season of 1891-2 was about 63 cents a bushel at tide water. At this price, and from the fact that taking season after season barley is considered a more certain crop than wheat, it can safely be expected to return a handsome profit to the producer.

OATS AND RYE.

The annual yield of oats and rye in California is small compared with that of the leading cereals, but the quality of these grains is excellent, and there is a large area in the State well adapted to their growth. The acreage devoted to oats is gradually increasing in the northern counties. The weight of this cereal is greater than in the Eastern States.

During the crop season ending June 30, 1892, the receipts at San Francisco amounted to 1,643,000 bushels of oats and 234,340 bushels of rye. The standard of measurement for grain is by the hundred pounds, or centals instead of bushels, but as the bushel is the more common standard in other States, that measurement is adopted in this article.

INDIAN AND EGYPTIAN CORN.

The yearly production of corn is 5,000,000 to 6,000,000 bushels. California consumes more corn than she produces. Probably three fourths of the corn crop is raised in the southern counties of the State, where it is produced without irrigation. In the San Joaquin Valley excellent crops are raised, but generally on irrigated lands. Yields of 60 to 125 bushels to the acre are not infrequent, the ears being large and regular, the kernels deep and plump, and the stalks often reaching a height of 20 feet. The price of California corn is nearly twice as great as that of Eastern corn. The average price here is about 61 cents, while in the Mississippi Valley it averages from 30 to 35 cents.

Egyptian corn is largely raised in California as a fodder plant, its grain being used in fattening cattle, hogs, chickens, etc., while it is eaten by some families in the place of rice. Irrigation is generally required for its growth. Both this and Indian corn are often planted after the barley crop is cut for hay, then when the corn is harvested barley is again planted. In this way many farmers secure two different crops a year, thus adding largely to their profits and with no apparent exhaustion of the land. Egyptian corn is chiefly raised in Kern, Tulare, and Fresno Counties.

THE HORTICULTURAL INDUSTRY.

By B. M. LELONG, President of the State Horticultural Society, Secretary of the State Board of Horticulture, and Chief Horticultural Officer.

Horticulture in California was practically begun in 1767, during the establishment of the Missions by the Franciscans, who seemed to be far-seeing, for they brought seeds and cuttings of fruits, which were planted and thrived abundantly. In 1792 there were growing at the different Missions about 5,000 trees, and these consisted of apples, pears, oranges, limes, lemons, grapes, and olives—all seedlings. This, of course, is a very small number, but those trees play an important part in the horticultural advancement of the State, as they proved the possibilities in fruit culture.

In 1812 and in 1830 several small orchards of mixed fruits were planted in Sonoma County, and also in Yolo and Los Angeles Counties in 1841 and in 1845.

Fruit culture was incidental. That it would ever become the chief industry of a great commonwealth was not then dreamed possible. In 1849, when the gold fever broke out, the majority of those who came here had their thoughts upon nothing but mining. True, a few men, perhaps not quite so adventurous as the others, or not so impatient for immediate gain, got possession of some of those orchards, took reasonable care of them, and afterwards found that with fruit in demand at high prices, they, too, had a "mine." This was the beginning of the fruit era, and the last twenty years have wrought a miracle upon the face of our land. Many of those old orchards which were the commencement of the fruit industry as a business, exist to-day.

There were, of course, many difficulties that beset its early history. These were overcome, and at last horticulture, established upon a secure footing, made such rapid strides, that in a few years California rose from an insignificant place among the fruit-producing States of the Union to become the orchard of the United States.

The demand for fruit of all kinds has since that time continually increased and spread, until to-day the orchard industry of our State leads all others, and California ranks first among the fruit States of the Union. Our fruits to-day, in various shapes, green, dried, canned, preserved, and manufactured into jellies, raisins, wines, and brandies, are shipped to every part of the world.

When people reflect upon the wonderful growth of population in the United States, that we are nearly doubling our numbers every twenty years, and that in a single century, if this ratio of increase should be maintained, our country would have a population of 1,000,000,000 persons, or a population equal to two thirds that of the globe, and when they remember that the science of the age has banished pestilence, and that the humanity of the age is fast vetoing war, they will see that a failure of the supply of food is the only limiting condition to this expansion of our numbers. When we hear the fruit growers express a fear that we are growing, or about to grow, a greater quantity of wholesome fruits, more nutritious nuts, and more human food generally, than there will ever be any market for, let them ponder the facts of the census. The future that their children will see will make greater demands upon the resources of the horticulturist. Where there is now a hundred pounds of fruit grown, a thousand will be called for. It does not take a prophet's vision to see the teeming millions with which their grandchildren will mingle, pressing eagerly on to occupy every acre of ground in all this vast continent. All the available land suitable for horticulture that science of man can bring under cultivation will be needed.

FRUITS GROWN, PROFITS REALIZED, ACREAGE, ETC.

The **Apple** does phenomenally well in California, and is the standard crop along the coast where the temperature is not too high, in the foothills of the Sierra and the Coast Range, and in the higher mountain counties. The fruit produced cannot be surpassed anywhere. To those having good apple lands adjacent to means of transportation to the centers of demand, the apple has proved a remarkably profitable crop. There are many thousands of acres of virgin land in the valleys and in the mountains where the apple can be grown to perfection—remarkable for beauty of appearance, flavor, size, and keeping qualities. In a very large part of the State the apple is the principal

fruit grown, and there are now 19,527 acres devoted to its culture; of these 13,751 are in bearing. The apple crop finds its market in San Francisco and other counties of the State, and is also shipped to the north and Eastern States and Australia.

The **Peach** and **Nectarine** thrive best in the higher soils of our warm valleys and lower foothills. They give a light crop the second year after planting, and good crops thereafter. The peach is grown very extensively, and handsome profits are realized from its culture. The fruit is sought for canning and drying purposes, and is shipped both green and dried to the Eastern States, and also exported to foreign markets. There are at present 54,827 acres devoted to peach culture, of which 33,791 acres are in bearing, and 1,080 acres in nectarines. The fruit is purchased at the canneries and driers for from \$20 to \$40 per ton. The dried product sells, peeled, at from 10 to 20 cents per pound, and unpeeled at from 7 to 12 cents.

The peach is both the favorite and the leading deciduous fruit in California. This State possesses more favorable advantages for peach growing than any other State in the Union. The fruit ripens earlier, is large in size, of superior flavor, and the tree begins to yield profitable returns as early as the second year after planting. Another great advantage in California is the entire exemption of the fruit from the diseases prevalent throughout the East, known as the "peach yellows" and the "peach rosette," which have played such deadly havoc among the peach orchards there. Frosts never affect the crop so as to cause a failure. The tree is long lived, and produces phenomenally large and regular crops. Another great advantage in peach culture is the naturally dry climate during the ripening season, which is advantageous in fruit drying, and for this reason no artificial heat is required. The ripening season is longer in California than elsewhere, being from May to December. Besides the large shipments made East, large quantities of peaches are canned and dried yearly. Only a few years since the shipment of ripe peaches to the East was deemed a hazardous undertaking; now the business of shipping green fruit East from California has increased to such an extent that more than 2,500 carloads were shipped to the Eastern States during 1892. Besides this, shipments were made of ripe fruit in refrigerator cars over 3,000 miles of land and 3,000 miles of sea to London and Liverpool. Over 400 tons, requiring nine special trains, reached foreign markets last year. Inquiries from Germany, as well as from other European countries, are coming in, and there is now a reasonable probability that each following year these new markets will demand a larger line of California fruits.

The **Pear** seems to adapt itself to diversity of soil, climate, and exposure more readily than most other fruits. It therefore grows to perfection over a much wider range of the State. Pear culture is being rapidly enlarged, and is a profitable one to pursue. Good shipping pears give splendid returns, as do also varieties for canning and drying. There are at present 23,442 acres in pears; of these 14,368 are in bearing. Pears sell for shipping, at from 60 cents to \$1 per box of 42 pounds; for canning, at from \$30 to \$40 per ton; the dried product sells for from 7 to 15 cents per pound.

The **Apricot** is one of the choicest of fruits grown, and in no State of the Union does it flourish so well or yield such early returns as it does in California. The culture of this favorite fruit in the United States is entirely limited to the Pacific Coast, and California in particular. In the cultivation of most fruits California is forced to compete with other portions of the Union, but apricot growers have the world for a market. There are 30,025 acres in apricots in the State—19,831 in bearing. Apricots sell at the canneries and driers for from \$30 to \$40 per ton; the dried product sells at from 7 to 18 cents per pound.

The **Quince** produces abundantly in most every section of the State and does well wherever the apple and pear are grown. The fruit reaches enormous size and is of the finest quality. It meets with ready sale and is manufactured into jellies, etc. There are only 192 acres planted, of which 150 acres are in bearing.

The **Cherry** is a favorite fruit in the different portions of the State which are adapted to the fruit. It makes a fine growth and bears abundant crops. California cherries are remarkable for their size, flavor, and beauty of appearance. The cherry crop of California aggregates a very large amount, and has always been found a remunerative crop under favorable conditions. It finds a ready market within the State, especially the earlier kinds. The bulk, however, is shipped East, and brings high prices. Early cherries bring extraordinary prices, and the later kinds from 4 to 8 cents

per pound, for shipping and canning. We have here growing the largest cherry orchards in the United States, and also the largest cherry tree in the world. This tree was planted in 1853, and is 10 feet in circumference and over 80 in height. In 1891 it yielded 3,000 pounds of choice fruit. There are 6,729 acres planted to cherries in the State; of these there are 4,563 acres in bearing.

The **Fig** is one of the oldest of cultivated fruits on record. It grows everywhere in the State, but most luxuriantly in the warmer regions. Many fine varieties have been introduced of late, and improved methods of handling have been discovered. There are now 5,231 acres planted to the fig; of these 2,553 are in bearing. The proper process for its curing has been discovered, and it is now put up in a most attractive manner. In 1889 the first carload of dried figs was exported, which sold in New York at high prices, fully two months before the imported fig reached our shores.

The **Olive** is very widely grown, and almost the entire State seems well adapted to its culture—the higher parts above 2,000 feet of the Sierra range and the lowlands near the ocean alone excepted. The industry is, as yet, not very extensively developed, but bearing areas can be found in almost every county in the State, and all bid fair to become paying investments. There is every prospect that it will soon become a very important industry. There are now 7,997 acres devoted to olive culture, of which 2,883 are in bearing. In 1891 there were 11,200 gallons of olive oil produced, which found a ready market at from \$10 to \$12 per case of one dozen quart bottles. About 50,000 gallons of ripe olives were made into pickles, and sold readily at from 60 cents to \$1 50 per gallon.

According to official reports the importations of olive oil were as follows: In 1881, 384,413 gallons, value \$480,683. The importations increased each year. In 1890 they were 893,984 gallons, value \$819,110; in 1891, 605,509 gallons, value \$733,489; in 1892 the value was \$876,613. The number of gallons imported in 1890 was more than double the number imported in 1881. In 1892 the value of increase over 1891 was \$143,124. Now add the amount produced and sold in California and you have an idea of the commercial demand for olive oil in the United States.

The amount paid for imported pickled olives from Cadiz, Spain, in 1891, was \$259,410; from Marseilles, France, \$11,118; from other sources, including Italy, \$49,632; total in 1891, \$320,163. Increase from 1890, \$108,346.

Ten years ago there was but one brand of olive oil put up in this State, and less than 500 gallons were made, but now there are over a dozen different brands, and the demand increasing faster than the production.

The product of the State in gallons is as follows: 1888, 590; 1889, 1,142; 1890, 5,202; 1891, 11,011; 1892, 10,000; total product from 1888 to 1892, 27,945 gallons. One fact should not be lost sight of, and that is that most of the olive oil imported is not pure, but heavily adulterated, which accounts for the very low figure at which it is sold.

The attention and influence of physicians should be directed to the general instruction in, and constant use of olive oil by all classes of people, from the fact of its wonderfully nutritious character, whether taken into the stomach as a food, or applied to the surface of the body for the same purpose, and also that it is not only healthy but at the same time is agreeable to the palate. In diseases of children, whether it be applied internally or externally, there is no remedy to take the place of olive oil.

The ripe pickled olive as a food has a value not usually accorded to it. The olives here referred to are not the green olives of commerce, which are very indigestible. My little boy was given olives and olive oil from the time he was six months old; he was given all he wanted and could eat, the result has been that he has never been sick and we have had no doctor's bills to pay.

Prunes.—The commercial value of California's prune crop is immense, and when it is taken into consideration that the prune was not introduced until 1856, and that for twenty years but little progress was made, it gives some idea of what to expect in the future. The amount of prunes now consumed in the United States is enormous, but the consumption is capable of great enlargement, as the superior quality and taste of the Pacific Coast product becomes better known. It will be years before the demand on this side of the Atlantic can be supplied, and when it is there will be the markets of Europe and the rest of the world to supply. There are now 49,626 acres in the State planted to prunes; of these 25,328 acres are in bearing. The plum is not so extensively

grown, there being 5,014 acres, 3,725 in bearing. The plum grows to perfection, and gives good returns, both for shipping and for canning.

The following table gives the foreign import of prunes and the California production for the six years from 1885 to 1892, inclusive:

YEAR.	Foreign Imports, by years, ending June 30.		California Production, by years, ending December 31— Pounds.
	Pounds.	Value.	
1885 -----	57,631,820	\$2,147,505 00	-----
1886 -----	64,995,545	2,026,595 00	2,000,000
1887 -----	92,032,625	2,999,648 00	1,825,000
1888 -----	70,626,027	2,197,150 00	2,100,000
1889 -----	46,154,825	1,423,304 00	15,200,000
1890 -----	58,093,410	1,789,176 00	12,200,000
1891 -----	34,281,322	2,054,486 00	27,000,000
1892 -----	-----	-----	25,000,000

The immense area devoted to prune culture testifies to the profound and well-founded confidence felt in the future of the industry by the people of California. Although but a comparatively new aspirant for public favor, the California prune has forced its way in advance of the imported article, and brings from 2 to 2½ cents per pound more than the French prune sold in competition with it. The proportion of pit and skin to meat in the California fruit is much less than in that of the French article, while the proportion of saccharine matter is much greater. These features give our domestic fruit its great advantage over the imported article. This popularity should be no surprise, as by preparation the California prune is a different article from the imported French or Turkish prune. Our prunes are more like dates, and when cooked are of a most delicious flavor. Besides this, dealers have found out that the California prune keeps better and longer, without sugaring, than the imported goods.

Prices for green fruit, delivered at the driers, range from \$25 to \$40 per ton; the dried product brings from 5½ to 10 cents per pound. Plums for shipping sell at from 40 cents to \$1 per box of 20 pounds.

The prune is a prolific bearer, and can be relied upon for annual crops. Unlike many fruits, it does not take an occasional season's rest, but will yield its average returns every season. If properly cultivated some fruit may be gathered the third year, and the fourth year will yield a fairly profitable crop; the fifth year will give from 50 to 60 pounds to the tree, which the sixth year should double. From this time on the tree can be considered as in full bearing, and will give from 150 to 300 pounds of green fruit annually.

CITRUS FRUITS.

The area devoted to citrus culture in California has been largely increased during the past few years. In 1892 there were planted 1,976 acres of lemons and 7,950 of oranges; of the latter Los Angeles planted 3,352 and San Bernardino 3,050. The immense profits of this industry have attracted the attention of capitalists, and several companies have been organized for the culture of citrus fruits on a large scale, which gives promise of a vast increase in citrus culture during the next few years. The relative importance of citrus culture in the State can be appreciated, from the fact that while its growth as a commercial industry is confined to the last ten years, the crop of 1892-3 amounts to about 6,000 carloads. Careful authorities place the present annual consumption of oranges in the United States at 5,500,000 boxes, or an approximate total of 825,000,000 oranges. A use of only one orange a day to each individual would require an annual supply of 23,725,000,000 oranges, and at an average of 500 to the tree it would require 678,000 acres to meet the demand, or more than ten times the acreage in California. California oranges do not meet the competition people suppose, because the crop ripens after the Florida crop is gone, and oranges from Mexico, Panama, and Tahiti come in earlier than the California crop, leaving the latter practically without a competitor.

An important feature in citrus culture is the fact that the large yields are not secured at a sacrifice of quality or flavor. On the contrary, the quality cannot be surpassed, and



ORANGE TREE.

the strongest evidence of this is in the fact that at the New Orleans World's Fair Exposition, gold medals were awarded to California for the *best* twenty varieties of oranges in competition against the world. At present there are 59,997 acres planted to the orange, 41,248 acres of which are in bearing.

Interest in **Lemon** culture has of late years shown a marked activity, and the acreage is annually increasing. There are many portions of the State especially adapted to the culture of the lemon, which has been found a very profitable fruit to grow, and the remarkable yields that have been obtained of fine-grained fruit have given a most encouraging outlook. Tests made by experts show that California lemons surpass the foreign by 33½ per cent in juice, besides possessing superiority in acid, thinner skin, and freedom from rag. The acid of the lemon more commonly enters into the prescription of physicians than other fruits, as it is remarkably conducive to health. They are especially beneficial in all febrile affections, and at the same time there is not a more grateful beverage than well-prepared lemonade.

The consumption of lemons is increasing rapidly in the United States, having nearly doubled during the past seven years, and it was only until recently that California lemons were known in the Eastern States. This condition of affairs existed for the reason that lemon culture in California was in the experimental stage, but it is no longer so; the proper varieties and methods of curing have been discovered, and to-day the shipments of lemons are extensive. There will always be a market for California lemons, as the importations for the last year reached \$4,548,000, representing 1,622,645 boxes of 300 lemons each, while the total output of California was less than one tenth this amount. Having all the required conditions for profitable lemon growing, there is no reason why these \$4,000,000 expended annually for lemons from abroad should not be kept within the United States. Our California lemons will slowly but surely keep driving the foreign from the American market, the same as other fruits have already done, such as the prune and raisin. An acre of lemons should yield at least a carload of fruit. This would be a very small estimate of three boxes to the tree. This fruit when cured is worth at least \$2 per box, or \$600 per acre. The lemon crop is gathered from October to December, and is then stored away for several months, until the market demands an acid fruit. Lemons in this way are kept as long as ten months without showing any deterioration in quality. The acreage of lemons is 10,062, of which there are 5,612 acres in bearing.

The **Citron** grows and fruits wherever the orange and the lemon are grown. We now have many new and choice varieties fruiting, which are of recent introduction. From the results already attained in the preparation of the citron, which is of superior quality, there can be no question but that in time the California preserved citron will supplant the foreign product in our markets.

The **Lime** bears well, although not very extensively grown. By the profits realized in lemon growing, no doubt the growing of this particular fruit is overshadowed. There are many sections entirely exempt from frost, where the lime does remarkably well, and gives good returns. There is no reason why the lime could not be more largely grown, and why the manufacture of lime juice and citric acid might not be carried on on a more extensive scale. Lime juice and citric acid are both necessities all over the civilized world.

NUT GROWING.

Nut culture is extensively pursued in California. The **Walnut** yields large returns. The area of its culture is spreading rapidly over portions of the State, where it finds a congenial home. There are now 14,912 acres planted; of these 6,520 are in bearing.

The **Almond** does wonderfully well in California, and the area is rapidly increasing. The tree is a good bearer and gives handsome returns. The varieties mostly grown originated in this State, are the most reliable, yield certain crops, and the nut has no equal. The crop is gathered as early as August and September, and can therefore be marketed two and three months before the imported can reach our shores. There are 10,906 acres devoted to the almond, 4,386 now being in bearing. The product has sold for from 10 to 30 cents a pound, and from \$100 to \$150 net has been realized per acre, the orchards not being over five years old, and as they become older the profits will necessarily increase.

The **Pecan** nut does remarkably well, although it has not been cultivated very extensively. The tree does best in a warm exposure and in a deep, rich soil.

The **Chestnut** does well wherever the walnut is grown. The fruit produced is remarkable for size and fine quality.

Hazel Nuts and **Filberts** are grown only to a limited extent, but do remarkably well in most portions of the State, and wherever the walnut grows they thrive and produce abundant crops. They are very productive and hardy, and rarely, if ever, fail to produce a good crop annually.

The **Pistachio** nut grows and does well in California.

Many new kinds of nuts are being introduced, and there can be no doubt but that they will prove remunerative.

GRAPE CULTURE.

In California nearly every variety of grape is grown, and from which handsome returns are obtained. California is the only raisin-producing State in the Union, and her raisins are known the world over, and this industry, which is only the outgrowth of the past twenty years, ranks to-day among the most important of our State. Our raisins are materially replacing the imported article, and in a short time the United States, instead of being an importer, will become an exporter of raisins. The official report of the United States census for 1890 contains this statement as to the yield over the previous year: "There were 1,372,195 boxes of raisins produced in the United States, of which the entire lot came from California. The market value was \$1 60 per box." In 1872, 6,000 boxes were produced; in 1883, 125,000 boxes; in 1892, 2,858,100 boxes, or 57,162,000 pounds. The importations were: In 1884, 53,702,220 pounds, value \$3,290,150; and in 1892, 23,250,809 pounds, value \$1,073,442.

There are now 82,222 acres planted to raisin grapes, and 16,452 acres to table and shipping grapes.

In 1891 an association was formed of raisin growers representing over 95 per cent of the raisin-producing acreage of the State, who agreed to observe the following minimum prices, which are calculated upon a basis that will pay the grower 4½ cents per pound in the sweat-box for all good raisins, both of the first and second crop: Clusters, \$2 per box of 20 pounds; 3-Crown London layers, \$1 65 per box; 2-Crown London layers, \$1 45 per box; 3-Crown fancy loose, faced, \$1 45 per box; 3-Crown fancy loose, unfaced, \$1 40 per box; 3-Crown loose, boxed, \$1 25 per box; 4-Crown loose, sacked, 5½ cents per pound; 3-Crown loose, sacked, 5 cents per pound; 2-Crown loose, sacked, 4 cents per pound; Seedless Muscats, 5 cents per pound; Seedless Muscats, fancy, 5½ cents per pound.

SMALL FRUITS.

Small fruits of all kinds are extensively grown in California, and are quite profitable. All kinds yield well, the strawberry crop especially being very large, and the fruit is of more than usual excellence. Blackberries, raspberries, and gooseberries all give good annual returns, and the producers find a ready market, both for domestic consumption and for canning, at fair prices. Considerable new land has been set, especially to blackberries and raspberries, which do well in most parts of the State. At present there are 4,539 acres in the State devoted to the culture of small fruits.

ACREAGE IN FRUITS.

There are many varieties of fruits produced here that do well and pay handsomely that cannot be produced in most of the Eastern States, as the citrus and sub-tropical varieties. The climate of California is particularly favorable to the fruit industry, and the soil in most portions of the State possesses in a large measure all the qualities required by the growing plant and the matured tree. These are facts which give assurance to the future of the fruit as a permanent and profitable pursuit. Another advantage which the California orchardist has over his brother in the East is the comparative freedom of our trees from insect pests and injurious tree and plant diseases. The vigorous system of quarantining against the introduction of such pests as the destructive curculio, black knot, the yellows, etc., which have wrought such havoc in large fruit areas of the East, has so far secured to our orchardists immunity from those

most destructive enemies to fruit culture, and gives them an almost absolute guarantee of protection in the future.

The fruit picking, curing, and packing gives employment to many of our people—women, boys, and girls. In the canneries and in cutting and pitting the fruit for drying, they are more deft than men, and in working by the piece can earn high wages. All members of a family are called into action during the long fruit season in California. Children, during school vacation, find employment at canneries and drying houses, the light outdoor exercise contributing to health, strength of body, and cheerfulness of spirits, especially when combined with the thought that the work of nimble fingers will result in providing some desired comfort.

The following is the acreage devoted to the culture of different fruits in the State as enumerated in 1892 by the State Board of Horticulture, collected by special agents:

NAME OF COUNTY.	Total Bearing.	Total not Bearing.	Grand Total.	NAME OF COUNTY.	Total Bearing.	Total not Bearing.	Grand Total.
Alameda	13,302	3,097	16,399	Plumas	72	13	85
Alpine	16	12½	28½	Sacramento	10,055	2,490	12,545
Amador	445	627	1,072	San Benito	1,151	562	1,713
Butte	4,215	8,251	12,466	San Bernardino	36,635	12,601	49,236
Calaveras	791	555	1,346	San Diego	12,795	2,987	15,782
Colusa	930½	1,218	2,148½	San Joaquin	3,567	2,413	5,980
Contra Costa	2,335	1,575	3,910	San Luis Obispo	3,262	1,384	4,646
Del Norte	113½	36½	150	San Mateo	361	69	430
El Dorado	2,023	502	2,525	Santa Barbara	6,243	3,196	9,439
Fresno	47,174	2,725	49,899	Santa Clara	15,953	7,984	23,937
Glenn	1,552	855	2,407	Santa Cruz	4,170	3,206	7,376
Humboldt	1,047	325	1,372	Shasta	1,144	1,017	2,161
Inyo	326	165	491	Sierra	93	-----	93
Kern	7,386	1,806	9,192	Siskiyou	895	677	1,572
Lake	1,022	707	1,729	Solano	12,442	6,458	18,900
Lassen	486	97	583	Sonoma	7,977	4,640	12,617
Los Angeles	20,450	13,383	33,833	Stanislaus	603	703	1,306
Marin	636	141	777	Sutter	1,811	1,034	2,845
Mariposa	415	145	560	Tehama	4,302	3,058	7,360
Mendocino	848	626	1,474	Trinity	185	60	245
Merced	1,952	1,009	2,961	Tulare	15,442	6,167	21,609
Modoc	280	-----	280	Tuolumne	519	126	645
Mono	11	-----	11	Ventura	3,397	7,758	11,155
Monterey	1,580	886	2,466	Yolo	9,483	2,184	11,667
Napa	1,579	1,681	3,260	Yuba	987	1,018	2,005
Nevada	1,005½	678½	1,684				
Orange	12,206	2,434	14,640				
Placer	4,826	3,576	8,402	Totals	282,496½	118,918½	401,415

FRUIT SHIPMENTS.

The shipments of deciduous fruits increased from 1,832,310 pounds in 1871, to 336,184,986 in 1892. If we estimate that it takes five pounds of green fruit to make one of dried, and three pounds of grapes to make one of raisins, it will be seen that California produced in 1892, exclusive of home consumption, 677,355,546 pounds of fruit.

The trade in canned fruits is one of the most important industries in the State. The export trade has developed a steady and substantial growth. In 1876 the output was 270,833 cases; in 1892 it was 1,847,000 cases.

The following is from the "California Fruit Grower": During the season of 1892, the 33 canneries operating in California packed fruit as follows:

	Cases.
Apricots	385,757
Peaches	565,455
Pears	268,479
Plums	135,296
Other fruits, berries, grapes, cherries, etc.	247,409
Total pack	1,602,396

As indicating the great importance and vast possibilities of the fruit industry of California, a statement of the exports for 1892 is given, compiled from a report to the California State Board of Trade by Gen. N. P. Chipman, Chairman of Committee on

Industrial Resources of the State. The total amount shipped by rail in 1890 was 16,194 cars, or 323,915,181 pounds; in 1891, 17,738 cars, or 354,778,210 pounds; in 1892, 18,741 cars, or 374,826,050 pounds. The total by sea and rail in 1892 was 20,495 cars, or 409,917,266 pounds. In the above amounts nuts are included, as follows: 1890, 1,574,230 pounds; 1891, 2,623,560 pounds, and in 1892, 4,126,025 pounds.

Fruit Shipments East by the Southern Pacific System, in 1892.

PLACE.	Deciduous Green Fruit, Lbs.	Citrus Fruit, Pounds.	Dried Fruit, Pounds.	Raisins, Pounds.	Nuts, Pounds.	Canned Fruit, Pounds.
San Francisco-----	332,000	222,000	7,394,000	894,000	364,000	30,108,000
Oakland-----	3,034,000	-----	226,000	-----	120,000	4,028,000
San José-----	14,084,000	-----	18,948,000	60,000	20,000	16,030,000
Stockton-----	12,106,000	-----	9,888,000	39,366,000	34,000	2,662,000
Sacramento-----	62,142,000	2,000	7,890,000	1,500,000	482,000	14,572,000
Marysville-----	3,962,000	-----	3,340,000	328,000	122,000	3,408,000
Total north of Tehachapi-----	95,660,000	224,000	47,686,000	42,148,000	1,142,000	70,808,000
Los Angeles-----	800,000	17,852,000	5,484,000	1,692,000	1,170,000	3,108,000
Total by S. P. Co.-----	96,460,000	18,076,000	53,170,000	43,840,000	2,312,000	73,916,000

Fruit Shipments East by the Santa Fe System, in 1892.

COUNTY AND PLACE OF SHIPMENT.	Deciduous Green Fruit, Lbs.	Citrus Fruit, Pounds.	Dried Fruit, Pounds.	Raisins, Pounds.	Nuts, Pounds.	Canned Fruit, Pounds.
Los Angeles-----	7,328,940	10,311,000	2,299,060	393,320	1,412,940	3,170,600
Orange-----	733,090	5,103,000	730,910	240,000	209,720	25,520
San Bernardino-----	6,221,540	35,322,000	2,202,460	5,016,000	58,780	439,720
San Diego-----	945,120	903,000	333,550	3,624,000	23,800	3,980
Total south of Tehachapi-----	15,228,690	51,639,000	5,565,980	9,273,320	1,705,240	3,639,820

Summary of Fruit Shipments by Rail, in 1892.

KINDS.	S. P. Co.	Santa Fe System.	Total Pounds.	Total Cars.
Green fruits, deciduous-----	96,460,000	15,228,690	111,688,690	5,584.43
Citrus fruits-----	18,076,000	51,639,000	69,715,000	3,485.75
Dried fruits-----	53,170,000	5,565,980	58,735,980	2,936.79
Raisins-----	43,840,000	9,273,320	53,113,320	2,655.66
Nuts (almonds and walnuts)-----	2,312,000	1,705,240	4,017,240	200.76
Canned fruits-----	73,916,000	3,639,820	77,555,820	3,877.79
Cars-----	287,774,000 14,388.7	87,052,050 4,352.6	374,826,050 18,741.3	----- 18,741.18

Fruit Shipments by Sea from San Francisco, in 1892.

	Pounds.
Canned fruits-----	32,991,600
Dried fruits-----	696,681
Green fruits-----	1,060,510
Nuts-----	108,785
Raisins-----	233,640
Total pounds of all kinds-----	35,091,216
Total in carloads-----	1,754.5

Total pounds by sea and by rail, 409,917,266; total cars by sea and by rail, 20,495. The places from which shipments are made are terminal points, from which all shipments for the East are billed.

SHIPMENTS OF CITRUS FRUITS.

The following table shows the importance of citrus culture in the State, and also its rapid growth. The figures are given for the southern counties, where the bulk of the fruit is produced. About 12 carloads were exported from the other counties in 1891, and 22 carloads in 1892-3, which is a rapid increase for these new citrus belts:

COUNTIES.	1890.		1891.	
	Boxes.	Cars.	Boxes.	Cars.
Los Angeles	198,695	781	632,071	2,212
San Bernardino	487,000	1,705	487,882	1,708
Orange	112,190	307	147,332	516
Ventura	9,460	33	19,475	68
San Diego	6,600	23	18,861	66
Santa Barbara	-----	-----	6,478	23
Totals	813,945	2,849	1,312,099	4,593

Figures of the output for crop of 1892 are not yet available, but it is estimated that it will reach over 6,000 carloads, the highest yet produced.

SHIPMENTS THROUGH THE CALIFORNIA FRUIT UNION.

The California Fruit Union, an association of orchardists, and which controls a large part of the output of deciduous fruits of the State, reports the shipments by it for 1892 at 1,694 carloads, an increase of 351 carloads over the preceding year, and an increase of 846 carloads over 1888, the first year of operation. The shipments were principally from Vacaville, Newcastle, San José, Winters, and Sacramento.

The markets to which the above shipments were made were as follows: Chicago, 715; New York, 365; Boston, 99; New Orleans, 62; Louisville, 7; Minneapolis, 156; St. Paul, 68; Omaha, 102; Kansas City, 28; St. Louis, 52; Philadelphia, 40. Total, 1,694.

The duplicate account of sales of shipments made, thus far received, show that 1,233,239 packages of fruit sold for \$1,908,219 12 gross, out of which was deducted \$700,409 04 for freight, \$142,323 14 for cartage, commission, and storage; a total of \$842,732 18, leaving \$1,065,486 94 as net money received by the shippers.

DRIED FRUITS.

In 1880 we shipped to the markets of the East 590,000 pounds of dried fruit, and in 1889 over 33,000,000 pounds, or fifty-six times the volume of the shipments of 1880. The shipments of 1890 of dried fruit were 64,595,181 pounds, 65,090,220 pounds for 1891, and 58,735,980 pounds for 1892. In 1880 the shipments of raisins were less than 800,000 pounds, and in 1889 they reached 18,000,000 pounds, 41,120,330 pounds in 1890, 44,954,850 pounds in 1891, and 53,113,320 pounds in 1892.

The rapid increase in population in the United States promises a steadily increasing demand for our fruit products, for fruit is *not* now, as it was in the earlier part of the century, an article of luxury—it has become a food necessity. Aside from our home market there is a large foreign demand for our fruits, and they are shipped dried, green, and canned to various parts of the world from California. A few years since California imported nearly all her canned goods from the East, but now she supplies the markets of the Eastern States, Australia, and Europe with fruit, the superiority and cheapness of the California article having forced it to the front in competition with all others.

In 1880 our exports of fruit brought, probably, about \$700,000, while they now amount to \$20,000,000. This wonderful result has brought with it what is above all computation, to wit: the demonstration that fruit growing in this State is very profitable, and is almost absolutely safe from frosts and other drawbacks, and has practically no limit. Another promising sign is the gradual decreased importation of many foreign fruits into the United States, and the increased output of the domestic product.

MARKETS AND PRICES.

The fruit is mostly marketed by the growers themselves, and in some sections local coöperative organizations have been formed, through which the major portion of the products have been handled. The California Fruit Union was organized in 1885, and a large portion of the deciduous fruit crop has been shipped through it, and as a rule the fruit shipped through the Union has brought good prices. It is a coöperative organization, with about a thousand members. On all shipments a rebate has been declared to its members.

Of local associations the Campbell Fruit Growers' Union is perhaps the most active. Last year it handled fruit to the extent of about one fourth of the capacity of their plant, viz.: 539 tons, including green and dried fruits. Of this amount 404 tons were processed (dried) for stockholders, 83 tons sold green, and the remainder was received and sold fresh and dried. The fruit netted to the stockholders per ton, green: Apricots, average, \$40 96; peaches, \$22 84 to \$46 82; Silver prunes, from \$48 75 to \$58; California (syn., French) prunes, as follows:

SIZE.	Price per Ton Green.	Pounds Green to 1 Pound Dried.	Price per Pound Dried.
40's to 50's -----	\$75 51	2.56	12 cents.
50's to 60's -----	84 44	2.20	10¾ cents.
60's to 70's -----	87 06	2.09	10½ cents.
70's to 80's -----	89 77	1.93	10 cents.
80's to 90's -----	96 16	1.71	9½ cents.
100's to 120's -----	102 31	1.45	8 cents.

Average price of six grades was \$84 95; average price of five grades (leaving out 40's to 50's) was \$88 43. The President of the Union remarks: "We were surprised to learn that the smallest prunes brought the highest prices. This was due to the smallest grades losing so little in drying." Prices of green fruit were as follows, net: Apricots, \$42 50; early peaches, \$45; Muir and Cling peaches, \$50; Salway peaches, \$60.

The cost of drying fruit per ton, green, was as follows: Apricots, \$6 25; peaches, \$6 50; Silver prunes, \$2 50; California (syn., French) prunes, \$2 25.

The proportion of green fruit required to make a pound of dried fruit was as follows: Apricots, 5.14 pounds; peaches, 5.16 pounds; Silver prunes, 3.02 pounds; California (syn., French) prunes, from 1.45 to 2.56 pounds.

The prices realized for dried fruit per pound were as follows: Apricots, 13 to 17 cents; peaches, from 10 to 12 cents; Silver prunes, from 9 to 11 cents. The advantage of this organization to the producer was that all the fruit sold for spot cash, f.o.b. The receipts of the Union from all sources were \$42,650 77, and the disbursements \$42,052 15.

The following table shows the prices realized for fruit in New York, as reported by a leading fruit auctioneer:

	1889.	1890.	1891.	1892.
Average gross per carload of 24,000 lbs. of fruit.	\$1,241 69	\$1,415 16	\$1,114 54	\$1,323 80
Average net per carload of 24,000 lbs. of fruit.	616 67	805 48	489 50	756 89
Gross average per 10-pound box of cherries -----	1 45	1 61	1 38	1 12
Gross average per 40-pound box of Bartlett pears	2 90	2 54	1 82	2 18
Gross average per 20-pound box of apricots -----	1 47	1 48	1 29	1 30
Gross average per 20-pound box of peaches -----	1 44	1 64	89	1 10
Gross average per 20-pound box of prunes -----	1 61	1 76	1 23	1 37
Gross average per 20-pound box of plums -----	1 44	1 68	1 15	1 33
Gross average per 40-pound box of Tokay grapes	3 90	3 90	2 80	3 56
Gross average per 20-pound box of Tokay grapes	2 23	1 99	1 30	1 56
Gross average per 20-pound box of Muscat grapes	1 41	1 28	85	95
Gross average per 20-pound box of Cornichons	2 01	2 03	1 78	1 69
Gross average per 20-pound box of Emperors	1 90	1 94	1 31	2 76
Total number cars sold in New York -----	300	741	665	675

SEMI-TROPICAL FRUITS.

According to the report of the Census Bureau, the acreage in the United States devoted to the culture of the different fruits enumerated, in 1890, is as follows: Almonds, 13,515; orange, 184,003; citron, 169; walnut, 12,180; guava, 550; figs, 4,477; lemon, 7,256; limes, 495; olives, 7,097; persimmons, 1,362. These figures are most remarkable, for while the acreage given is no doubt conservative and low, yet it shows that most of these fruits must be grown exclusively, or nearly so, in California; for instance, the acreage of figs is given at 4,477 acres, while there are 5,231; of olives, 7,097 acres are given, while there are 7,997; of walnuts, 12,180 acres are given, while there are 14,912 acres; of lemons, 7,256 acres are given, while there are 10,062½ acres; of almonds, 13,515 acres are given, while there are only 9,228 in the State, showing that California has over two thirds of the area planted. Of oranges, there are 184,003 acres given, while we have 60,007 acres, or very nearly one third of the entire area. The Census Bureau, for reasons best known to itself, fails to enumerate the following fruits, which are extensively grown in California: the apple, pear, peach, cherry, and the grape.

IMPORTS OF CITRUS FRUITS.

In 1885 the value of the importations into the United States of oranges was \$2,088,204; of lemons, \$2,510,426. In 1892, oranges, \$1,133,959; lemons, \$4,580,211.

For the year ending October 31st there were 614,628 boxes of oranges imported as against 1,050,988. Of lemons for the same period there were 2,291,700, as against 1,828,720 respectively. These figures show that there has been a falling off in the imports of oranges, while there is a notable increase in the imports of lemons. Thirty years ago there were imported into the United States 300,000 boxes of citrus fruits. In 1889 Florida contributed 600,000 boxes to supply the demand, and California contributed 780,000 boxes. Thus the country into which thirty years ago were imported 300,000 boxes of citrus fruits, produced within its own borders 1,380,000 boxes. In 1889 there were imported into the United States 3,354,963 boxes and 113,927 barrels of citrus fruits; thus, the importation, notwithstanding the production of California and Florida, was eleven times more than that noted prior to the beginning of home production. Thirty years ago the entire demand in the United States was imported. While this country has become a producer to the extent of 1,380,000 boxes the importation in the same time has risen to nearly 4,000,000 boxes, thus constantly widening the margin in favor of the home producer, and forever silencing all prophecies of over-production.

In the years 1891 and 1892 there were imported into the United States foreign fruits as follows:

ARTICLE.	Year ending Sept. 30, 1891.		Year ending Sept. 30, 1892.	
	Quantity. Pounds.	Value.	Quantity. Pounds.	Value.
Figs.....	9,263,497	\$867,089	8,537,457	\$517,093
Lemons.....		4,884,039		4,580,211
Oranges.....		2,308,784		1,133,959
Plums and prunes.....	32,081,702	1,940,102	13,421,167	506,070
Preserved fruits.....		1,302,104		938,071
Other fruits.....		649,007		604,448
Almonds.....	5,936,812	893,709	7,803,600	1,030,026
Raisins.....	34,866,448	1,790,546	23,250,809	1,073,442
Totals.....		\$15,062,208		\$11,237,285

At this present writing the report for December quarter was not at hand and the table shows, for convenience, the years ending September 30th.

These figures clearly indicate that there is a large and increasing home market for California fruits yet unfilled, and are encouraging. Despite the heavy demand for California fruits in 1890 there was an increased importation of foreign fruits into the United States of \$4,772,439 over the preceding year, and a total of \$16,816,897 was paid out in that year for foreign fruits.

COST OF PRODUCT.

Deciduous Fruit Orchard.*—Mr. A. T. Hatch, the largest and one of the most enterprising fruit growers in the State, estimates the cost (not including land) as follows:

	Per acre.
Trees, labor, staking, and planting	\$25 00 to \$30 00
Pruning and cultivating, first year	10 00 to 15 00
Pruning and cultivating, second year, replanting	3 00 to 5 00
Pruning and cultivating, third year	12 00 to 15 00
Pruning and cultivating, fourth year	15 00 to 15 00
Total	\$65 00 to \$80 00

Pears and peaches should, with favorable conditions, produce enough to pay expenses the fourth year. Peaches often produce \$100 to \$150 an acre the fourth year. Prunes and pears will not be in as good bearing condition before the sixth year as peaches are in the fourth.

Vineyard of Table Grapes.*—Mr. C. W. Reed, one of the pioneers in fruit growing in the State, estimates the cost of a vineyard, as follows:

	Per acre.
Rooted vines, 10x10, 430, at \$15 per thousand	\$6 45
For plowing	1 50
Harrowing and marking before planting	2 00
Planting with plows	3 00
Cultivation, first year	5 00
Cultivation and pruning, second year	8 00
Cultivation and pruning, third year	10 00
Total	\$35 95

The fourth year a vineyard of table grapes should yield from two to four tons, worth from \$25 to \$40 per ton.

Orange or Lemon Orchard.—The cost of a lemon or orange orchard depends upon what is paid for the land. Estimating the first cost of the land at \$200 per acre, the cost of a 10-acre bearing orchard can be given as follows:

First cost—	
10 acres land, with water, at \$200	\$2,000 00
Clearing, plowing, etc.	150 00
Cost of trees, 2-year buds, 1,000 at \$1 each	1,000 00
Setting out same	70 00
	<hr/>
	\$3,220 00
Care of orchard first, second, and third years	\$450 00
Care of orchard fourth and fifth years	400 00
Interest on \$3,220 for five years, at 7 per cent.	1,127 20
Taxes	100 00
	<hr/>
	2,077 20
Total	<hr/>
	\$5,297 20

Contra.

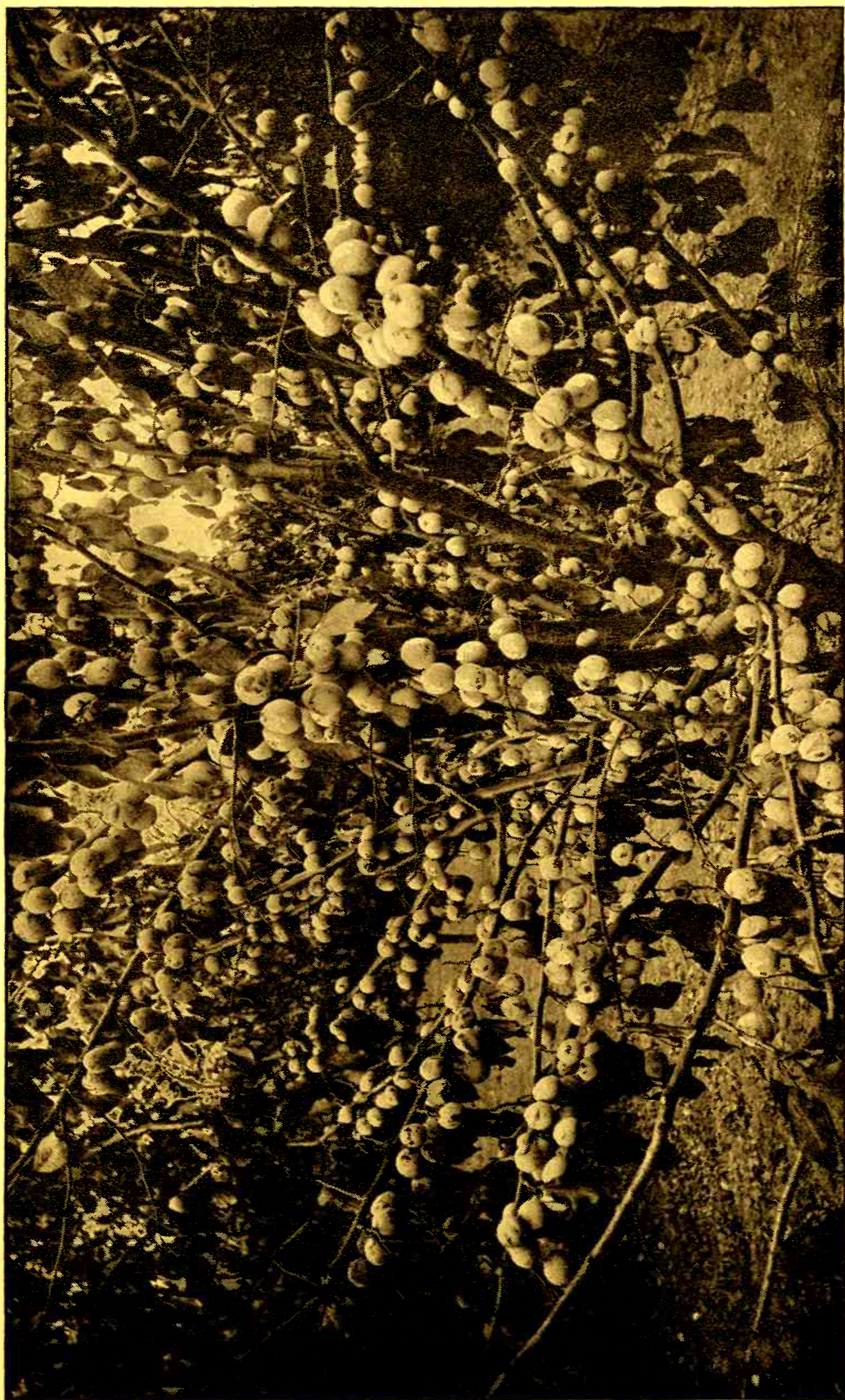
Yield the fourth year, ½ box to the tree, 500 boxes, at \$2 50	\$1,250 00
Yield the fifth year, ¾ box to the tree, 750 boxes, at \$2 50	1,875 00
Total	<hr/>
	\$3,125 00

After the fifth year the yield increases rapidly. One thousand dollars an acre is as low as such an orchard can be bought. Thus, in five years the balance sheet would stand:

Yield of orchard the fourth year	\$1,250 00
Yield of orchard the fifth year	1,875 00
Value of orchard	10,000 00
Total	<hr/>
	\$13,125 00
As above stated, cost	<hr/>
	5,297 20
Net profit, over all expenses, including interest	<hr/>
	\$7,827 80

The estimate of returns is based upon fruit selling for from \$2 50 to \$3 50 per box. This showing is made from the standpoint that the owner of the orchard gives no personal attention to the care of his ranch, but has hired all his work done.

*The above reports were made in response to questions put by the "Record-Union," a paper issued in Sacramento City, and published by that paper. They were selected from among a number of other responses as being average statements.





VINICULTURE.

By WINFIELD SCOTT, Secretary Board of State Viticultural Commissioners.

It is a matter of regret that for some time past wine-grape growing and wine and brandy making have not been as profitable in California as could be desired. Nevertheless, in spite of the drawbacks incident to unprofitable operations, a vast improvement in the quality of the products, and in the manner of disposing of them, has been effected by those engaged in the viticultural industry; and those who are in a position to judge, expect a revival of interest and an increase in prices in the immediate future.

It is not difficult to account for the temporary depression which has existed. About 1880 began an increase in the acreage devoted to the wine and brandy grape varieties. About that time, owing to the short supply of wine for the then small wine market, and the consequent large returns from bearing vineyards, attention was extensively called to the wine and brandy business. The many new vineyards planted at this period came into bearing from 1884 to 1889; thus greatly augmenting the vintage. In the meantime no adequate provision had been made for the sale of the wine. Prices of wine, of vineyards, and of vineyard lands receded as a natural consequence, and the wine makers and merchants found themselves face to face with the difficult problem of urging consumption.

That this has been met is evidenced by the fact that the annual shipments of wine out of the State—in 1880, about 3,000,000 gallons—have grown steadily, until, in the year 1893, they will reach the handsome total of over 12,000,000 gallons. Add to this amount the coast consumption, which is estimated at about 8,000,000 gallons, and the quantity of wine now required to meet the demands of trade is 20,000,000 gallons.

The maximum of production was undoubtedly reached in 1891, when the total was not far from 22,000,000 gallons. Since then, production has actually decreased, on account of the vineyards destroyed by the phylloxera and the Anaheim disease being devoted to the planting of deciduous fruits, and the neglect of owners.

The future is now a question of supply and demand. The limit of production, for five years at least, has been reached, as no new bearing vineyards can be created before that time. On the contrary, the present demand has not only grown to the point of possible supply, but has caused a material shrinkage of old stocks. This demand is from every Eastern State and Central America, Mexico, Japan, Hawaii, Tahiti, Germany, and England. It is founded, substantially, on legitimate demands and must be met as it grows. Such, then, is the situation to-day. Wine buyers from the cellars of the producers are willing to pay from 50 to 75 per cent better prices than a year ago, and the market is very firm.

One of the most pleasing changes in the trade in the past five years, is the prominence and success attained by various vineyard brands. Time was in California when no such brands were known or recognized. The various shippers and merchants sent their wines to their customers in bulk, and the customers in turn did the bottling, using what labels they pleased. Realizing the value of a foreign label, these Eastern buyers and bottlers placed the wines of California under foreign labels. The extent to which this deception was and is practiced, is attested by the fact *that in the United States to-day not to exceed one tenth of the wine drunk is of foreign origin.* This statement can be amply proved by reference to the statistics of the Treasury Department of the United States Government, which show the total annual imports of foreign wines into the country do not exceed 4,000,000 gallons, while the annual production in California and the States east of the Rocky Mountains is not less than 40,000,000 gallons.

All over the State of California, however, are vineyardists who take a special pride in their selected wines, who bottle their best products under their own labels, and who sell their wines for what they are. Many California wine merchants are also doing the same. These honest bottlings are slowly and surely making their way throughout the Union, and are gradually dissipating the prejudice formerly entertained against domestic products.

As to the quality of California wines, it may be said that their *average* quality is above the average of either the French or German wines of like types; and that there are well-

known selected growths which will compare favorably with the selected foreign wines. It is not claimed that the acme of perfection has been, or will soon be, reached, but it is true that the quality is such as to command the respect of experts and connoisseurs, as the medals awarded at the Paris Exposition of 1889 amply demonstrate.

The future of the business seems bright. Like any other industry, the wine industry of California has had its reverses and its successes, but it is established on a firm basis, and the prospects for profits are excellent.

Brandy distillation is likewise on a firm foundation. The annual production is about 2,000,000 gallons, much of which has a market in Germany and England, and the rest in the Eastern States. The quality of the brandy produced has much improved in the recent past, and producers of a fair to choice article readily sell what they make.

The culture of the wine grape and the making of wine is a fascinating pursuit, and will always attract, as it has in California, intelligent and cultured minds. The State fosters the industry by a large expenditure of money. Nearly every known variety of wine grape is growing in California, experiments are continually being made in fermentation, the literature published by the State is exhaustive, and every opportunity offers for the investment of capital in a business that calls for the highest intelligence and will ultimately yield a handsome profit.

DAIRYING IN CALIFORNIA.

By G. G. WICKSON, of San Francisco.

California has many notable advantages for the dairy farmer. Her animals come to profitable maturity sooner than in regions with a severe winter; they enjoy an open-air life the year round, and are healthier than cattle held for months in stables, and owing to abundance of succulent food and freedom from the loss of food materials to maintain animal heat during cold winters, both the growth of the animal and the yield of milk are more satisfactory than in regions with a northern climate.

Because natural conditions were so favorable dairying was carried on in this State for many years with less trouble and less investment than the Eastern dairyman would have believed possible. Profitable dairy enterprises have been conducted without any shelter whatever for the cattle, and with nothing but a shed roof to protect the dairy machinery and appliances. Such dairy practice is not mentioned as desirable, but it is indisputable evidence of favoring climatic conditions. It has been found here, as elsewhere, that the most perfect machinery and buildings, the most scientific system in manufacturing, and the most humane treatment of animals are all profitable to the dairyman; but the Californian, having a genial climate to work under, can secure the most favorable conditions with less difficulty and expenditure than are required in the older dairy regions. His buildings do not need to be made tight enough to exclude cold, nor strong enough to sustain heavy snowfalls. His water pipes never freeze, and his milk and cheese rooms very seldom need any artificial heat.

But the absence of severe cold is not the only advantage of the California climate. There is almost as great benefit in the absence of the close, "muggy" days and nights which are so trying to animals and to the milk after it reaches the factory. Although the temperature sometimes runs high in California, it is always attended by a dry air, which lessens the effect of heat, both upon animals and perishable products. "Tainted" milk is rarely met with, and cheese makers of long experience say they never have had a "floating curd" in California. It is quite possible to practice the "sweet curd" process continually, because the milk is uniformly sound. The same condition is, of course, of inestimable value to the butter maker. Any fair handling of the milk insures a clean flavored product. This is the case even with the old fashioned shallow-pan setting of milk. Setting shallow is the best rough practice in this State, because ice is high priced and cool water not obtainable for deep setting, except in the mountain dairy districts. Since the introduction of centrifugal separators, and the throwing out of all systems of gravity setting by our most progressive dairymen, butter making has been greatly simplified, the labor decreased, the yield increased, and the dairyman made almost inde-

pendent of high temperatures, because he can easily cool his cream can and his butter, though it were impracticable to cool the mass of the milk during cream rising.

Probably nowhere else in the world is all-the-year dairying so easily carried on as in California. The natural pasturage season, in all save the mountain region of the State, covers the winter months. On the coast and in the valleys the feed starts afresh in the pastures after the fall rains in November. Sometimes there is ample green feed from that time until the following June. Some years there is a fall and early winter drought, so that feeding has to be pursued more or less until February. This is, however, an easy task to the dairyman who has enterprise enough to provide against the vicissitudes of the season. Mangel wurzel seed sown on moist land in May and June produces beets which can be fed from the field all winter. Squash grown in the summer can be stacked in the open air without injury. Corn fodder can be siloed for fall and early winter use, or rye or other grain sown early in the fall can be cut and fed green, until the natural pasture comes into good condition. Such materials as these, which the dairyman can cheaply grow for himself, will enable him to largely prevent the shrinkage of milk which is apt to come as the pastures dry in midsummer, and to carry the cattle along, if there should be a late start of grass in the fall. In addition to home-grown food supplies, the enterprising dairyman will also make liberal use of bran, oil meal, and other mill feeds, because good cows always return a profit upon liberal expenditure for good food.

Though the early dairying in California proceeded upon the natural grasses alone, the industry has been greatly benefited and extended by the introduction of good forage plants. The king of the introduced forage plants is alfalfa, the Spanish name for lucerne (*Medicago sativa*), which was brought here in an early day from Chile. In the warm valleys of the State, with land either naturally moist or irrigated, this grand clover makes a growth of surprising weight and richness, and stimulates a great yield of milk. The same number of acres will probably carry more cows on this plant than with any other in the world. Fed green or as hay, it will support cows the year round, and being of high proteine contents, is directly adapted to flesh-forming and milk-making. Alfalfa dairying is one of the chief branches of the industry in the State.

The dairy industry of California has notably advanced during the last few years. The building of creameries has begun, and the export of the product to distant markets is in progress. There seems to be a great opportunity for the extension of this manufacture and trade. All around the Pacific Ocean are countries which are now being supplied with canned butter from the dairy regions of northern Europe. Such markets should be supplied from California, and if the same exact methods of manufacture and packing, which are relied upon in northern Europe to secure good shipping butter, are introduced here, the result will unquestionably be satisfactory. This export field, coupled with the growing demand from our fast increasing local population, justify a considerable extension of the California dairy industry.

During the past year a number of large creameries and a large number of smaller ones have been built and equipped with the very latest improved machinery and appliances, and the output from these creameries is all that could be desired, both in quality and quantity. Some of the largest creameries, located in the older and most populous coast counties, have demonstrated chiefly the advantages of improved methods and uniformity of product, while other creameries, located farther in the interior, have not only accomplished the results mentioned above, but are largely and rapidly developing the dairy industry, where but very few cows, comparatively, were being milked before.

With such marked advantages in the way of climate, feed, and favorable local conditions, the dairy interest in California cannot fail of wonderful development.

NOTE.—The above article was contributed by Mr. G. G. Wickson, of San Francisco, who has had a wide experience in dairying and is a dealer in improved dairy machinery. His statements are conservative. The Assessors report in the State 3,569 thoroughbred cows, 171,010 American cows, 40,050 graded cows, and 44,510 common cows, but the number of milch cows is not reported. It is difficult to state the amount of butter and cheese produced in the State, but that the field is not occupied is apparent when it appears that we imported in 1892 from the East 1,500,000 pounds of butter. It is the experience of dairymen that, owing to absence of heat, irritating insects, and the long season of pasturage, more milk is obtained from a cow than in the East. Two to four cows to the acre can be kept on alfalfa fields. Dairy land, fully equipped with cows and utensils, rents for from \$20 to \$25 per acre.—EDITOR.

IRRIGATION IN CALIFORNIA.

Contributed by GEO. F. WEEKS, Editor of "The Californian."

Probably no feature of the marvelous development of the Golden State, and of late years the rest of the commonwealths of the Pacific Slope, bears a greater interest to the Eastern immigrant, home-seeker, or visitor than the irrigation system, which has reached its greatest development in the counties which have come to be known as the citrus belt of Southern California, and incidentally, as the garden spot of the earth. To the uninitiated the stories of how bare and seemingly desert wastes have been transformed into the present very much-in-evidence bowers of floral beauty and stately vistas of orange, lemon, and other semi-tropical foliage within the short span of a decade or two by little trickling streams of water led over the thirsty soil, are exceedingly hard to believe, and in many instances the narrator of the facts is looked upon with suspicion until added experience shall have amply proved to the newcomer that the stories he has been told are fully borne out by facts.

In the city of Riverside, where irrigation has reached its greatest degree of perfection, and which may almost claim to be the originator of the system in Southern California, is to be found the most conspicuous example of what faith, determination, and intelligent effort may produce. One incident, which happened within the writer's own experience, will show the marvelous results, both in the increase in land values and desirability as a place of residence, the life-giving water accomplished within the space of two years' time. One mile east of a fruitful settlement whose lands were irrigated, was an immense tract of exactly the same kind of land, totally bare of vegetation, and apparently as worthless as ever the sun shone upon. A section of this land was preëmpted under the Desert Land Act of the United States by a relative of the writer. A shaft was sunk 108 feet deep, but no water was obtained. Becoming discouraged the owner sold his rights to a capitalist, who, eight miles away, sunk a system of artesian wells, and brought the water to the barren section and upon other sections of similar land adjoining. With the advent of the water, the land jumped in selling value from less than \$1 an acre to \$350, \$450, and even \$600 per acre. It is now covered with typical Riverside homes, embowered in flowers and surrounded by evergreen orchards, while time after time lands in the same tract have since changed hands at from \$1,000 to \$2,000 per acre after being improved with suburban homes and orange groves. There are hundreds of locations in California to-day where this very experience will be repeated in the years to come, and gigantic schemes to reclaim millions of acres are even now in process of completion in various counties of California, Arizona, and Nevada.

The first irrigation done in California was carried on by the padres of the old Missions in the latter part of the last century, and in spite of the decay and desolation, which are prominent features of the Missions to-day, the remains of many of the old acequias and ditches may still be traced. Great canal and reservoir systems, or more properly speaking, their ruins, are still found in Arizona and New Mexico, together with traces of the prehistoric peoples who inhabited the deserts of that section when they were undoubtedly highly cultivated farms, orchards, and vineyards. In spite of the ancient uses of water for irrigation it has only been within the past twenty-five years that Americans have taken it up, and brought it to its present high state of development. Originally the supplies of water were derived from running streams that were diverted with ease from their natural channels. No expensive dams were built, but the water was turned from its channel in the easiest and cheapest manner possible. In the southern part of the State, where there was, of course, the greatest necessity for irrigation on account of the limited rainfall, streams which could be handled in this way were not numerous nor did many carry a great volume of water. This fact led to experiments in the search for artesian wells.

The first successful artesian well is said to have been struck in Santa Clara County about forty years ago. The greatest development in this direction, however, has been within the past fifteen or twenty years, and at present there are several thousand wells of this character in various portions of the State. Kern, Tulare, Los Angeles, and San Bernardino Counties lead in the number of artesian wells and area irrigated thereby.

One well in Kern County is said to yield from 2,000,000 to 2,500,000 gallons daily. In San Bernardino County is the most remarkable artesian belt in the State, containing several hundred wells. They range in depth from 100 to 300 feet, and the amount of water obtained, of course, varies with the diameter of the pipe. From some of the wells in this belt comes the water to irrigate the lands at Riverside referred to above. They are from four to ten inches in diameter, and the average daily flow is thirty-three miner's inches. The sight of one of those wells in full flow is one to draw enthusiasm from the most apathetic observer.

In some sections another method of obtaining water for irrigation is that of tunneling into the hills or mountains where a spring denotes the presence of an imprisoned body of water. Some streams of considerable size have been developed by this method. Many of the streams of California in the summer season, when the water is needed for irrigation, sink through the bed of sand and course along on the bedrock. Some of these streams have been successfully raised to the surface and diverted upon irrigable lands, by building a dam with its base resting upon the bedrock and extending upward to the surface, thereby forcing the water to rise to the top of the channel and to flow into the ditches prepared for its reception. Pumping with windmills and steam pumps is also resorted to upon a limited scale.

But the most important and successful system in the reclamation of vast tracts in the past, and which will prove the salvation of other large areas in the future, is that of impounding the rains of the winter season in reservoirs formed in most instances by building dams across the outlets of natural depressions or gorges in the mountains, from whence the water is diverted as necessity requires upon the fertile valley lands miles below. Just ten years ago the first work was done on the immense stone dam which holds the water of the Bear Valley reservoir on the headwaters of the Santa Ana River, and since then vast sums have been expended in similar enterprises. This reservoir is a mountain valley 6,000 feet above the sea, from the lower end of which dashed a rushing mountain torrent. At this point the walls of the valley came together and there the dam was built in the form of an arch from one side of the rocky gorge to the other, the ends buttressed into the solid rock of the cañon. The radius of the arch is 335 feet, its height 64 feet, and its thickness 20 feet at the base and 3 feet at the top. Sufficient water is stored to cover an area of 2,812 acres, amounting to 20,000,000,000 gallons. The region supplied with water from this reservoir consists of several thousand acres in San Bernardino, Riverside, and San Diego Counties. A very similar dam, but much more elaborate in construction, is built a few miles southeast of the city of San Diego, forming the Sweetwater reservoir. It supplies the water for the irrigation of a large section of country between San Diego and the boundary line between the United States and Lower California.

Another reservoir of note, but of a different type, is that of the Crocker-Huffman canal system at Merced. This is a natural depression, and the basin was converted into a reservoir by the construction of an earthen embankment 4,000 feet long. It is 275 feet thick at the base and 20 feet at the crown, with a maximum height of 54 feet. This reservoir impounds 5,500,000,000 gallons. Those mentioned, together with the immense canal systems of Kern and Tulare Counties, are the largest in the West, and are great factors in the material development of the State. Some of the canals of Kern and Tulare are 125 to 140 feet wide, and more closely resemble rivers than artificial watercourses.

When the American horticulturist first began to use water for irrigation he found the most primitive methods and processes for distribution in use. The water was turned upon the land and allowed to run whither it would, with what little direction the workman felt disposed to bestow upon it. This system worked all right enough, perhaps, when water was plentiful and cheap, on account of the limited number of people using it, but with settlement a better system had to be devised. The method then was to plow furrows alongside the rows of trees and down the center of the spaces between, into which the water was turned from the open ditch at the head of the tract running at right angles to the lateral ditches, a man regulating the flow with a hoe or shovel and keeping the water flowing slowly in the ditches until the ground was thoroughly soaked on either side. This method is practiced almost entirely in many sections to this day, and is considered by some irrigationists to be the best, all things considered, when the water is plentiful enough. But the seepage into gopher and squirrel

holes, and the evaporation and waste in other ways, have necessitated in many sections the substitution of pipes and hydrants in the orchard and a system of basins about each tree.

While many of the main canals and ditches are cemented or paved with concrete, where the system of open conduits prevails, pipes will of necessity take their place as the water becomes more precious and a larger area is to be covered. With experience has come also the knowledge that much less water is required for the perfect growth of plant life than was thought necessary in former days, so that by American ingenuity and intelligent study it has become possible to convert desert spots into garden plots, which even so late as ten years ago were considered not even fit to pasture sheep upon.

As an illustration of the value of irrigation and the effect it has had upon public prosperity in California, a statement of the increase in taxable values is interesting. In the four counties of the southern part of the State, and three counties in the San Joaquin Valley, where the irrigation system is not highly developed, the increase in twelve years was as follows:

	REAL ESTATE.		IMPROVEMENTS.	
	1880.	1892.	1880.	1892.
Los Angeles* -----	\$10,477,432	\$47,819,620	\$3,033,059	\$15,822,920
Orange -----		6,428,030		1,616,140
San Bernardino -----	1,669,007	14,571,300	586,577	5,181,430
San Diego -----	1,307,302	19,245,803	341,948	4,608,505
Fresno -----	3,795,415	31,028,305	520,085	5,371,608
Kern -----	2,166,755	8,326,048	524,071	1,134,417
Tulare -----	1,949,929	18,613,739	1,863,226	2,378,928
Totals -----	\$21,365,840	\$146,052,845	\$6,868,966	\$36,113,948

* In 1880 Orange formed part of Los Angeles County.

NOTE.—As the Governor has stated in the introduction, the question of irrigation needs to be understood in the East. In the San Joaquin Valley and some parts of Southern California, irrigation is an absolute necessity, but in the central counties it is not, except for citrus fruits. The major part of the fruit shipped from California is raised without irrigation. Cultivation, which conserves the moisture, takes the place of irrigation. It all depends on the amount of the rainfall and the power of the soil to retain the moisture. There is no doubt that irrigation increases the yield. Irrigation is not a prime factor in all California; it is only necessary in certain sections where the rainfall is deficient. Major J. W. Powell, of the Geological Survey, says: "The most highly developed agriculture of the world is now found in California." In California \$13,000,000 has been spent on irrigation works and right of way. According to the census report there are 13,732 irrigators, irrigating 1,004,233 acres. Since then the numbers have increased.—EDITOR.

CALIFORNIA PETROLEUM AND ASPHALTUM.

Since anything has been well understood concerning California it has been known that petroleum and its residuum, asphaltum, were among the products of the State. The abundance of asphaltum was evident, but it is only by recent experiments that the richness of the oil deposits has been ascertained.

Attempts to develop oil were made at Santa Barbara as early as 1865. They were unsuccessful, and nothing much was done in this direction until 1876. In the meantime, it had been observed that there were several oil "breaks" in the State. These may be defined as the Northern, Central, and Southern "breaks." The first is in Humboldt County, and as little work has been done there, its value is not well defined. The second is in Santa Cruz County, extending along the coast into Monterey and San Luis Obispo, and thence over the Coast Range of mountains into Fresno and Kern Counties. The most successful work on this has been done in Kern, near Bakersfield. The third, and, so far as known, richest deposit, begins in Santa Barbara County, runs through Ventura County, extends over into Los Angeles County, and is lost in the desert beyond San Bernardino. They all trend southeasterly from some point near the ocean.

The oil from Pico Cañon, near Newhall, is light gravity, but that from Brea Cañon, near Puente, in Los Angeles County, is very heavy, some of it being semi-asphaltum. The wells at the latter place, near the bottom of the cañon, are shallow, not more than 50 feet deep, and yield about 5 barrels each per day; but as wells have been sunk in the face of the sides of the cañon, they have increased in depth the nearer they are to the crest, and they have also increased in yield, while the oil is less dense.

There are 22 wells now in this cañon; a "dry hole" has never been struck. Every well is now yielding as much as when first bored, the total output being about 200 barrels per day. It is a heavy oil, at best, and is nearly all used for fuel purposes in Los Angeles, where it sells for \$2 per barrel. The semi-asphaltum from the shallow wells is worth \$5 per barrel for coating water and gas pipes and the ends of posts that go below the ground.

The Pacific Coast Oil Company has in Pico Cañon, perhaps, 40 wells; the oil-bearing stratum is 350 to 785 feet thick. The wells struck fifteen years ago are still yielding as largely as when first bored. One well, in a strip of land 850 by 3,800 feet, has yielded 1,500,000 barrels of oil. Another well has yielded 300,000 barrels of oil; both are still as good yielders as at first. The oil belt here is 8 miles long, and all seemingly of even richness. The output now is about 400 barrels a day. It is shipped to Alameda Point, near San Francisco, where it is refined for illuminating purposes, the oil being very light.

Only a beginning has been made in this oil-boring enterprise. The Southern "break" is over 250 miles long. For 100 miles between Santa Barbara and Newhall oil derricks line the road all the way. Every well thus far bored is still a yielder, not one having gone dry. The Union Oil Company has one which is estimated to have yielded 400,000 barrels. The California wells are not nearly so deep as those of Pennsylvania. They range at from a few feet to 3,000 feet deep. The average depth is from 800 to 1,200 feet.

The success of these ventures was so well known by 1885 that a great stimulus was given the industry, and since then hundreds of oil claims have been made between Santa Barbara and Newhall, and a score of companies are at work. The most important of these is the Union Oil Company, whose headquarters are at Santa Paula, Ventura County. This company controls a very large amount of territory and has a great many wells in successful operation. The output is probably 700 barrels a day. The smaller concerns combined get about 350 barrels a day. If we add the figures we now have, it will appear that this southern oil belt is yielding 40,000 barrels of oil a month, or about 500,000 per annum. Three years ago the output in all the territory was only 1,000 barrels, and two years ago only 1,300.

The oil in the Union Company borings might be used for fuel or illuminating, as some is heavy and some very light, but the company has preferred to convert the product of their wells into lubricants, ink, and other manufactured products that add manifold to its value.

The California oil differs radically from that of Pennsylvania, as its residuum is asphaltum instead of paraffine. It is this quality which makes our oil so valuable for varnishes, lubricants, and inks. Other products are made at the laboratory at Santa Paula, but their nature is kept secret until such time as they are perfected and ready to put on the market. One is known to be a fabric that may be used for oilcloth, as it is impervious to water. Another is tubes in which electric wires may be run. The black ink produced is of high excellence, and is used to print the San Francisco "Examiner" and the Los Angeles "Times" and "Express." The "Examiner" takes 15,000 pounds per month.

The asphaltum deposits are nearly as valuable as those of oil. They exist in practically inexhaustible quantities. Prof. E. W. Hilgard, of the State University, has written to Henry Villard that in three miles of territory in Ojai Valley, Ventura County, there are 1,000,000 tons of asphaltum. Last year there were shipped from the State 50,000 tons of this product. It is used for street purposes in many cities. Most of that used in the United States comes from Trinidad. The United States Consul at that point, in his report October, 1892, shows that in seven years—1885 to 1891—there were shipped from there to New York 10,062 tons of refined asphaltum and 274,467 tons of raw. The California product is in all respects fully equal to the imported.

The definite location of the oil belts and the certainty of the yield make this industry one of the most inviting fields for the investment of capital.

THE SUGAR BEET IN CALIFORNIA.

By RICHARD GIRD, of Chino, San Bernardino County.

The sugar beet is a native of the semi-tropical lands bordering the northern shores of the Mediterranean. After having migrated, as an edible plant, through southern Europe, and as far north as Germany and France, it was taken by the people of those countries as the most available plant to secrete from the elements the hydro-carbon called sugar. During the last one hundred years the beet has been improved from an average of 5 and 6 per cent of sugar to 12 and 15 per cent, and has at last become the most important sugar-producing plant in the world.

In America, experiments have been carried on for many years to ascertain whether the sugar beet could be adapted to the climate, soils, and conditions existing here. Finally, in the course of its migration, it was brought by some enterprising parties to California, the climate of which is semi-tropical, exactly corresponding with that of its nativity—the northern shores of the Mediterranean. Here, the cultivation has proved an unqualified success from the first, and has only needed such mechanical and chemical knowledge to make it very profitable, both to the agriculturist and the sugar manufacturer. The experiments carried on in this State the past few years have proved that the sugar beet is not only a remunerative crop to the farmer, placing him beyond the fluctuations of market for his product, but giving him a diversified industry which compels a thorough cultivation, increasing the products of the soil for other crops, and the value of the land from the fact of the enhanced value of the sugar beet crop.

California, last year, produced 22,000,000 pounds of sugar—more than double the amount produced the previous season. A good deal of this increase came from the Chino sugar beet plantation and factory, in San Bernardino County, where, probably, the conditions and results are as satisfactory as in any other place where the sugar beet has ever been grown.

Capital stands ready to take up the erection of sugar factories, at least in all the valleys of Southern California, if not in the State. The only thing necessary is to satisfy the capitalist that he would be assured of a sufficient amount of beets to keep his factory running at its full capacity during the ordinary sugar-making season, from August 1st to December 1st. There is no reason why the deep alluvial, semi-alkaline soils of the San Joaquin and Sacramento Valleys, as well as all the deep alluvial valleys of the Coast Range, particularly in Southern California, should not raise sugar beets to perfection. The results on the Chino plantation last year were, that we obtained the remarkable sugar percentage of 15 per cent plus, average, and a maximum of 22 per cent; of this latter percentage we had many loads delivered direct from the fields into the factory. Experiments were conducted by me for three years, in which beets were planted in many different places, of many different varieties, and were constantly analyzed by myself, so that when the factory was built it was no speculation, as we knew just what could be done.

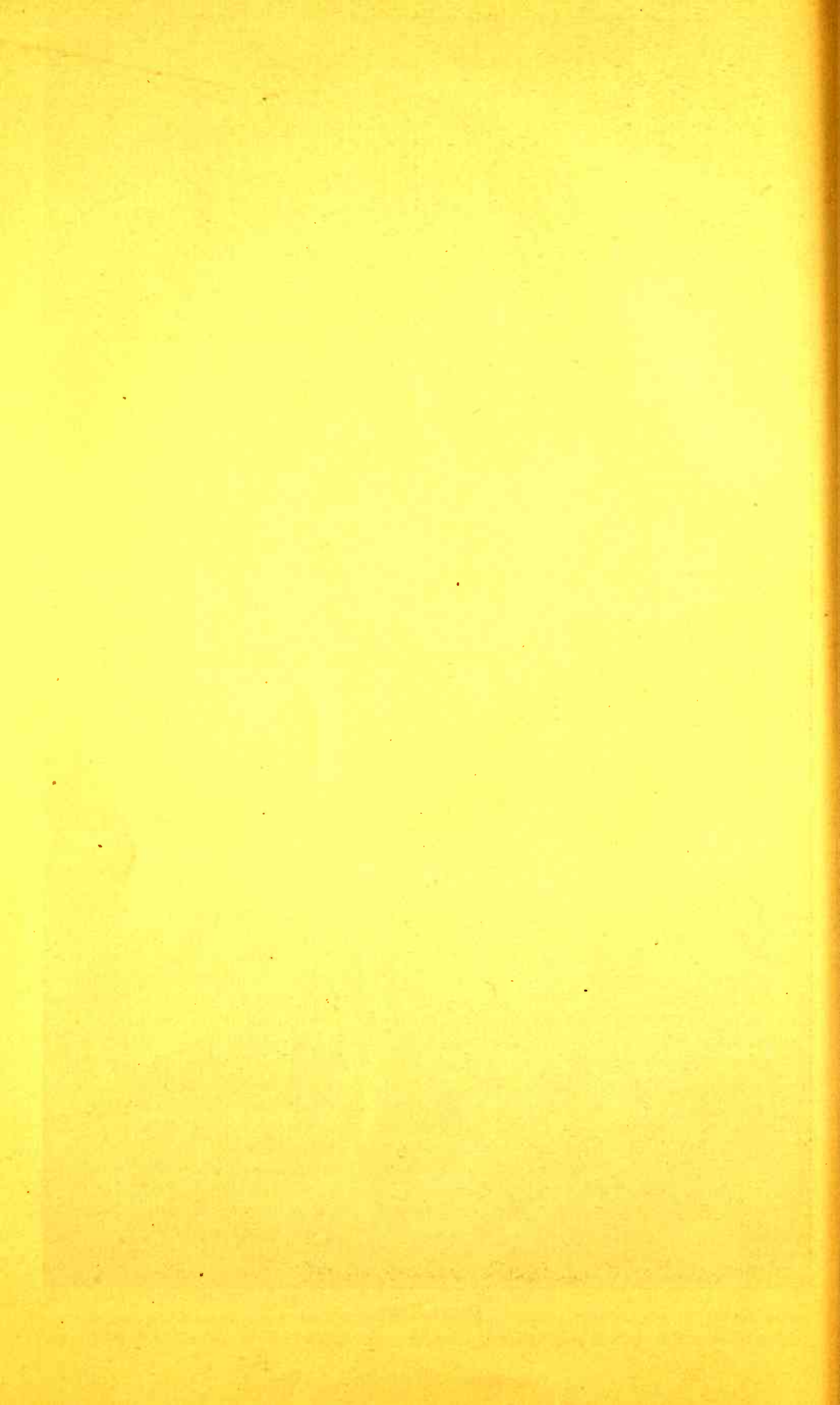
One of the great advantages derived by the beet grower and sugar manufacturer, from the favorable conditions and climate of California, is that the length of the season will enable the beets to ripen much earlier than in Europe, or the north temperate portions of the United States. This gives a much longer season for harvesting and manufacturing, thereby enabling a factory of a given capacity to produce a corresponding output of sugar for the capital invested, and the farmer to harvest his beets without danger of rain or frost and those many climatic disadvantages and annoyances that affect the industry in colder regions. Moreover, here, the beets can be worked direct from the fields into the factory, giving much better results, and saving all the expense and trouble of siloing and handling, which have to be done in the cold climates of Europe and the north temperate zone of the United States.

Appended are certain statistics which will show that California can build and maintain three hundred factories of the capacity of the one at Chino (600 tons of beets per day), and what they would add to the revenue of the State.

The annual consumption of sugar in the United States being 3,575,000,000 pounds, would warrant the erection of three hundred factories like the one at Chino, estimating



OLIVE TREE.



the output of that at 12,000,000 pounds. This would represent the investment of about \$150,000,000 of permanent capital on this coast, with a saving to the country of over that amount in cash sent abroad for the purchase of foreign sugar, and a distribution among our farmers, laborers, and mechanics of an amount equal in value to the quantity of sugar manufactured, probably \$140,000,000. The beet sugar industry would thus become the most important agricultural interest on the Pacific Coast.

The annual amount of sugar consumed per capita in the United States has increased from 26 pounds, in the year 1851, to 55 pounds in 1892. At the present time 180,000,000 pounds of sugar per annum are used on the Pacific Coast, or about 70 pounds per capita, the existing factories only supplying one ninth of the amount consumed.

The consumption of sugar, in pounds per capita, for the principal countries of the world, during the year 1887, was, according to Government statistical reports: Finland, 1.32; Roumania, 3.30; Servia, 4.40; Spain, 5.11; Italy, 7.59; Russia, 9.02; Portugal, 9.55; Norway, 11.35; Austria and Hungary, 12.10; German Empire, 18.92; Belgium, 15.71; Sweden, 17.49; France, 27.06; Switzerland, 22.77; Holland, 23.10; Denmark, 29.63; Argentine Republic, 49.94; Great Britain, 70.40.

The total product of the beet sugar factories in the United States for the season of 1892 is as follows:

	Pounds.
Norfolk Beet Sugar Company, Nebraska-----	1,698,400
Oxnard Beet Sugar Company, Nebraska-----	2,110,100
Utah Beet Company, Utah-----	1,473,500
Chino Valley Company, California-----	7,903,541
Alameda Company, California-----	2,506,860
Western Sugar Company, California-----	11,390,921
Total-----	27,083,322

A comparison of 1891 and 1892 by localities shows the greatest increase in production was in California:

	1891— Pounds.	1892— Pounds.
Utah-----	1,094,900	1,473,500
California-----	8,175,438	21,801,322
Nebraska-----	2,634,500	3,808,500

The production of beet sugar in Europe for the season of 1892-93 was 6,804,000,000 pounds, an increase over 1883-84 of 2,082,000,000 pounds. The use of beet sugar over cane sugar is constantly increasing, the increase in 1892 being 1,218,000,000 pounds. The field for the production and marketing of beet sugar challenges the imagination. Three hundred factories, allowing 5,000 acres to the factory, would make an acreage of 1,500,000, or 2,344 square miles of territory, which is a very small proportion of the alluvial valley lands of California, that are particularly and specially adapted to sugar beet culture. There is no reason, therefore, why California should not produce all the sugar for the United States.

Much has been written in Germany and Europe about the necessary amount of rainfall, temperature, etc., all of which we find to be practically reversed in California. The sugar beet is naturally a dry climate plant; its tap-root goes deep into the ground for moisture and nutriment.

The proof of all that I have claimed in this article is substantiated by the fact that, in spite of our high cost of labor, we are able to deliver beets to the factory at a less cost than is possible either in Europe or in the other sugar-producing States of the Union. All that is necessary to make sugar beet culture the first great industry of the Pacific Coast is to disseminate a knowledge of the business and the practical results already obtained. The following is a brief statement of what can be done on the Chino Ranch, conditions being about the average:

The average tonnage per acre last season was 15; the average price that will be paid by the factory this year is \$5 per ton; the average cost of production is \$25 per acre; so that the average net profit will be \$50 per acre.

The cost of production has been very materially reduced in the last year, and we hope this season, with the help of labor-saving machinery, to reduce it to at least \$20 per acre. This may seem low to beet raisers in the other parts of the State, but there have been actual contracts made this year by beet farmers with others, to prepare the land, seed, thin, weed, and cultivate, for \$10 50 per acre; this, with the cost of harvesting, \$12 per acre, would bring the cost of production to \$22 50 per acre.

I am willing to give instructions to all who desire to engage in this industry.

MINING FOR THE PRECIOUS METALS.

The history of mining in the State is briefly comprehended in the fact that from January 1, 1849, to January 1, 1892, the product of its gold mines has added \$1,250,000,000 to the bullion wealth of the world, and the best warrant for its future lies in the assurance that a still larger amount remains yet to be mined.

Almost every county of the State has produced more or less of the precious metals, though the greatest original producing districts, whether of quartz or auriferous gravel, still remain the chief sources of supply. Rich paying placers were originally worked along the banks of streams in almost every mountain county, and the immense product for many years, including the banner year of 1853, was obtained almost exclusively from this source. The gradual failure of the surface placers led up to the discovery and exploitation of quartz ledges, drift mining of large beds of auriferous gravels, and to hydraulic mining. In the prosecution of these new methods, veins have been worked to a depth of 3,000 feet, tunnels and drifts run for miles into old lava-capped channels, whole rivers diverted from their beds, and mountains of gravel sluiced away. To-day mining is mainly prosecuted under the branches of vein, drift, and hydraulic. The last two methods are employed to open up vast beds of gold-bearing gravel and the bedrock deposits of old river channels overlaid hundreds of feet by volcanic deposits. The gold-bearing gravel and cement deposits are located mainly on the western slopes of the Sierra Nevada, in the counties of Plumas, Butte, Sierra, Yuba, Nevada, Placer, El Dorado, Amador, Calaveras, and Tuolumne.

There is an ancient channel, called the "dead blue river," which extends from Downieville, in Sierra County, almost due south through the counties of Nevada, Placer, and El Dorado, a distance of 60 miles. The gravel is blue in color, and is overlaid by volcanic matter. Upon this channel are located the richest drift and hydraulic mines of the State. Its elevation at Downieville is 5,000 feet, and at Placerville 2,800 feet above the sea, and may be traced through Eureka, Quaker Hill, Dutch Flat, Gold Run, Georgetown, and Placerville. Mr. John H. Hammond, a mining engineer, estimates that this channel has yielded \$3,000,000 for every mile of gravel. Mr. John S. Hittell estimates that \$250,000,000 has been extracted.

The other channels are more or less broken up and are not continuously connected. One begins at the northeast part of Shasta County and thence runs southwest through Shasta into Trinity and across Humboldt County, and ends at the ocean at Gold Bluff. In Siskiyou County, along and adjoining Klamath River and its tributaries, are over one hundred hydraulic claims.

The so-called dead Stanislaus channel runs for 20 miles parallel with the present Stanislaus River. Upon this channel is situated the famous Table Mountain. Other systems are found in Yuba, Plumas, Butte, Amador, Calaveras, and Tuolumne Counties. Scientific opinion is divided whether these channels are ancient rivers; the popular opinion is that they are. At any rate they are well enough defined to warrant the expenditure of capital in their development. The elevations of the bedrock are so well known, and the geological structure of the country has been so well studied, that little risk is taken in exploiting them. The general theory of these auriferous channel deposits is that they lie on the bedrock of old, buried rivers, contain some gold throughout, but are by far the richest on the country rock at the bottom, and are covered from nothing up to 1,500 feet deep with volcanic ashes, tufa, lava, and mud from eruptive agencies active after the gold-bearing gravel deposits were formed. Sluicing away the

entire superincumbent mass by the force of water, thrown from large nozzles under immense pressure, is hydraulic mining, and running drifts to extract only the rich layers on the bedrock, is drift mining.

Gold-bearing quartz veins are principally found on the western slope of the Sierra Nevada, all the way from Plumas to Mariposa, and in the northern counties of Shasta, Siskiyou, Trinity, Humboldt, and Del Norte. There are also many ledges in San Bernardino and San Diego Counties.

What is called the "Mother Lode" consists of a series of gold-bearing veins, often of great magnitude, forming a nearly continuous line throughout its entire length, nearly in the center of what is termed the auriferous slate belt, and appearing at altitudes above sea-level, generally of the middle foothills, between 1,500 and 2,500 feet. The name, given to it by early miners, conveys no idea of any genetic relation to other veins or lodes. It has been definitely traced through Mariposa, Tuolumne, Calaveras, Amador, and El Dorado. It is difficult to secure any accurate estimates of the yields of the different districts on this great gold belt, but a few examples of the great number along the lode may give some idea of its productiveness: The Princeton, in Mariposa, up to 1865, yielded \$4,000,000 down to the 500-foot level; since then it has been legally tied up. The Bonanza, near Sonora, Tuolumne County, has taken out \$2,000,000 from a series of recurring pockets, half of it between 1882-84. The Morgan Hill Quartz Claim, in Calaveras, yielded \$3,000,000 in less than a year, most of the gold pounded out in a mortar. The Keystone, of Amador, has produced \$8,500,000. Though not on the lode, other mines have yielded as richly: Rising Sun, near Colfax, in Placer County, has turned out \$2,000,000. In Nevada County, the Idaho's record is \$10,000,000 from 1869 to date; the Eureka, \$5,700,000; Massachusetts Hill, \$5,600,000; Gold Hill, \$4,000,000; Allison Ranch, \$2,300,000, and Empire, Fellows, Huston Hill, Osborne Hill, and Gold Tunnel, \$1,000,000 each. Many quartz mines are now being operated in every county on the slope of the Sierra Nevada. Not so much attention to quartz in the counties north of the junction of the Sierra with the Coast Range has been given as to the lodes in the counties south, but lately there have been some surprising discoveries in Shasta and Siskiyou Counties. Here is almost a virgin field for prospecting.

As bearing upon the question whether the California mines are "exhausted," and to justify the conviction expressed in the introduction to this sketch, that there is more gold yet in the ground than has already been taken out, attention is invited to the following considerations. It was demonstrated in the '50s that California was the greatest gold field in the world. The same is true to-day. The districts which yielded the richest returns then are the greatest producers now. They still invite prospecting and development, with promise of rich reward. Nowhere else can be found ledges so numerous and well defined, gravel deposits so enormous, and such a net-work of blind river channels sure to yield returns. Fuel and timber are abundant and cheap. Over thirty rivers and streams rush perennially from the Sierra to the sea, their now wasted force waiting to be harnessed for the miner's use. Transportation is cheap. The mines are easily accessible and mostly situated at a low altitude, in a country well timbered and watered, where winter work is not interrupted by storms and snow, by ice and cold. Labor and material were never so cheap. Every conceivable improvement in machinery has been adopted to facilitate the extracting and working of quartz and gravel, and new processes have been invented which vastly reduce the expense of manipulation. In the early days rock under \$40 a ton would not pay. To-day an average of \$7 quartz, \$3 drift, and \$1 hydraulic are "bonanzas." The renewal of hydraulic mining, under lawful authority and governed by proper restrictions, is imminent, and such renewal will double the output of gold and bring numerous properties into the market.

Mining has now settled down to a business basis, and in every mining county there is renewed activity. All the lodes are not yet discovered. The oldest quartz mining section is Nevada County, yet new lodes are being discovered. The mining people are not the rough and uncouth characters so falsely depicted by sensational writers. The people are intelligent, enterprising, and hospitable, and mining is pursued amid all the surroundings of civilization.

The silver mines of California are mainly found in Mono, Inyo, and San Bernardino Counties, east of the Sierra Nevada. They are not now profitable, on account of the depressed silver market, but they constitute very important mineral deposits, which

better transportation facilities would develop into great activity. The silver production up to date is estimated at \$36,000,000.

Quicksilver is largely mined in California, and though deposits of cinnabar are found all along the Coast Range, the principal producing districts are Lake, Napa, Santa Clara, Sonoma, and San Benito Counties. The production for 1892 was 27,993 flasks of 76½ pounds each. The shipments from San Francisco for the same period were 27,108 flasks. The average value per flask for the year was about \$45.

Though foreign to a sketch of the precious metals, it is not out of place to terminate it by a brief notice of the fact that throughout the State are distributed large deposits of copper, iron, tin, lead, steatite, graphite, chromium, nickel, antimony, manganese, coal, petroleum, asphaltum, natural gas, lime, marble, slate, onyx, salt, sulphur, gypsum, asbestos, borax, soda, cements, ochre, magnesia, and infusorial earths. Their wide distribution is remarkable, and an extensive development of them is only awaiting the opening up of a demand and cheaper transportation. Several copper deposits are worked, however. Many coal mines, and sulphur, borax, soda, salt, lime, petroleum, asphaltum, slate, granite, and marble are mined, quarried, refined, and manufactured at the present time.

Those who are interested in a more detailed description of the mineral wealth of the State are referred to the State Mineralogist's reports for 1888 and 1890.

San Francisco is the best manufacturing center for mining machinery and supplies to be found anywhere. Besides furnishing the districts of her own and adjoining States, she ships yearly many expensive outfits to Mexico, Central and South America, and other foreign countries.

WHAT CAN BE DONE IN CALIFORNIA.

By E. W. MASLIN.

As Manager of the California State Board of Trade, I am often asked by inquirers in the East the questions: "What can I do in California while my trees are growing?" and "Is fruit growing profitable?" I can do no more than point out a few of the various branches of industry which promise a recompense while waiting for the orchard or vineyard to produce. The Eastern farmer generally depends upon several things to supplement his farm products. The poultry yard, the dairy, and live stock are relied upon to add to the account. But in California, whether wise or not I do not judge, the California horticulturist is a specialist. He is a fruit grower and nothing more. He is rather proud of his vocation, studies its needs thoroughly, attends fruit growers' conventions after the crop is gathered, and despises the day of small things. The Easterner would see opportunities which our people do not notice.

In his first message, in January, 1893, to the Legislature, Governor Markham adverted to the fact that while the State was in a prosperous condition, the people were importing large quantities of food products which could be produced by them. He shows that in 1892 the following articles and amounts were imported: Live stock, 40,000 tons; wool, 1,500 tons; poultry, 1,000 tons; eggs, 3,500 tons; meats and packing-house products, 20,000 tons; butter, 2,000 tons; cheese, 1,800 tons; hay, 1,500 tons; potatoes, 3,000 tons; flour, 2,500 tons; starch, 1,600 tons. With the exception of the last two all these products could be produced by the farmers of the State, and the profits realized the first year of the venture. Think how much is contained in the statement that California people import annually 40,000,000 eggs! During the fall and early winter months fresh ranch eggs bring 50 cents per dozen wholesale, the average for the year being about 33 cents. The average price for all classes of market fowls is almost double that of Eastern cities.

According to the "Journal of Commerce" we imported in 1892, 7,500,000 pounds of lard, 1,300,000 pounds of lard oil, and 576,000 1-lb cans, or 30 carloads, of condensed milk, to produce which required 2,000,000 pounds of milk.

Berries are always salable, but, of course, for the best crops, need irrigation. They, also, can be grown between the trees. Some of the reports of the profits appear fabulous, but are nevertheless true, ranging from \$500 to \$1,000 per acre. Strawberries, planted in August, produce a crop the next year. Raspberries are always salable.

Peanuts are produced in rich sandy loam, and are planted in May after the orchard plowing is over. A report in the "Rural Press" states that the yield from five separate fields was from 1,000 to 2,666 pounds per acre, which sold for 6 cents per pound.

Vegetables can be grown between the trees for at least three years. We do not raise enough to supply the demand. In 1891 we exported, of potatoes, 48,909,180 pounds; onions, 1,119,520 pounds; and other vegetables, 16,254,000 pounds; a total of 66,282,700 pounds.

If the whole of the orchard is not set out, especial attention might be paid to truck farming. The following is an estimate of the income and cost of labor per acre:

	Average Net Income per Acre.	Average Cost Labor per Acre.
Asparagus	\$217 00	\$33 00
Celery	247 00	87 00
Cabbage	145 00	20 00
Peas	77 00	17 00
Potatoes	107 00	13 00
Sweet potatoes	110 00	
Watermelons	54 00	13 00
Other melons	67 00	15 00
Tomatoes	65 00	32 00

Seed-growing offers a field which would employ the women and children. It involves light and pleasant labor. We import into the United States about \$5,000,000 worth of flower seed. California is singularly well adapted to seed-growing, and the crop is an exceedingly profitable one. We produce now more seeds than any other State, and Santa Clara County produces half of the crop. A lady of Ventura County is the pioneer seed-grower of the State. Her place is one of the attractions of the town of San Buenaventura. A gentleman at Ukiah, Mendocino County, is engaged in the cultivation of the native bulbs, and exporting them to Europe. Peter Henderson wrote, ten years ago, that "California would be the great seed and bulb-growing country of the world; that it has the exact conditions of climate for such culture."

Bee culture is another prominent industry in the State, principally followed in the southern part of the State. San Bernardino County produces annually 1,000,000 pounds; Los Angeles, 1,150,000, and Ventura, 600,000 pounds. Altogether, we produce 6,000,000 pounds. Each hive yields an average of 100 pounds annually.

There are an hundred "small things" to be done on the farm which will suggest themselves to the thrifty Eastern farmer, and which will be profitable. Labor is in demand during fruiting season. The prices paid, with board, are about \$1 25 to \$1 50 per day. In picking season the women and children find occupation. In school vacation the pupils find work in the orchards and vineyards.

We do not advise any man without means to come to California, but for the man with a few thousand dollars there is no place in the known world where the investment of his capital and labor will meet with a surer reward.

It has been often urged that the price of land is too high, but the term "value" is a purely relative one. The value of land is to be considered from the standpoint of income. A gentleman, who had farmed in Iowa and in California, once presented this statement to me:

Cost of Farm and Stocking It.

IOWA.		CALIFORNIA.	
160 acres of land	\$4,800 00	40 acres, irrigable	\$4,000 00
4 horses	400 00	2 horses	200 00
20 cows	600 00	10 cows	300 00
10 brood sows	60 00	5 sows	37 50
10 dozen chickens	30 00	10 dozen chickens	40 00
Total	\$5,890 00	Total	\$4,577 50

The California farm was planted: 32 acres to peach trees, 8 acres sowed to alfalfa, and peanuts planted between the trees. The Iowa farm had 40 acres pasturage, 40 corn to feed, 10 ensilage, 20 corn to sell, 10 hay, 40 oats to sell.

Gross Yield.

IOWA.		CALIFORNIA.	
20 acres corn, 1,000 bushels -----	\$250 00	32 acres peanuts -----	\$1,536 00
40 acres oats, 2,400 bushels -----	432 00	2,000 pounds butter, @ 22 cents ..	440 00
20 cows' cream, 8½ cents per inch--	680 00	25 hogs, @ 5 cents-----	312 50
50 hogs, @ 4 cents -----	500 00	1,000 dozen eggs, @ 18 cents-----	180 00
1,000 dozen eggs -----	80 00		
Total -----	\$1,942 00	Total -----	\$2,468 50

Balance in favor of California, \$526 50.

Suppose the net profit was the same, you have the advantage of a superb climate, with neither blizzards, snow, nor ice; over two hundred and fifty clear days in which labor can be performed; less acres to cultivate, and more leisure days and nights in which to enjoy the society of your family and neighbors. The eight acres of alfalfa can support the stock in pasture and with hay.

On the California farm there were half the cows to feed, half the horses to work, half the hogs to care for, half the crop to cultivate, half as much work to cut the three crops of alfalfa as to harvest the oats and hay in Iowa, and about half the running expenses. There are no costly houses to build, and no expensive barns for stock, owing to the clemency of the weather.

I leave you to figure on the value of 40 acres in California, which produces \$526 50 more than 160 acres in Iowa, with the other advantages added.

Wait until the peaches are in bearing. Read in the article on Horticulture the cost of cultivating the 32 acres. Let us see the value of the product in the fifth year. Mr. A. T. Hatch, one of our foremost fruit growers, puts the gross value of the peach crop at \$300 per acre, and the net returns at \$200. I estimate each tree will produce 200 pounds to the tree. The yield will be 640,000 pounds at 1 cent, \$6,400. Add to this the income from hogs, cows, and hens, \$932 50, and we have \$7,332 50. Peaches usually bring a higher price. Suppose you hire all your work done; \$2,000 to cultivate land, pick the fruit, etc., will cover all expenses, and you have a net profit on 40 acres of \$133 31 per acre. A California orchardist would criticise the last statement as too low. This sum represents the interest at 8 per cent upon \$1,666 62, the value of an acre of land set out to peaches. This return is based upon the proposition that the land is in a peach country and located near a railroad. In estimating the value of a home here, you must remember that vegetables and fruit can be grown nearly all the year. An acre of land well set to fruit in California is better worth \$1,000 than an acre in an Eastern or Western State at \$100. Land unimproved and advantageously situated can be purchased from \$50 to \$200 per acre, depending on the proximity to cities and density of population. No rule can be laid down. I know of two contiguous counties in the foothills. One is traversed by the overland railroad and is known as a fruit county. Land there is well worth from \$100 to \$200 per acre. The other county has a branch railroad only, the soil is of equal if not superior fertility and adaptability to fruit culture, but is not known popularly as a fruit county, yet land there can be bought for from \$20 to \$40 per acre. In a few years it will rank high as a fruit county. Such a county offers a great opportunity for a man with slender means.

If the inquirer will carefully read this book, he must be persuaded that California offers him a field equal to his ambition, with a surety of success in whatsoever vocation he may choose. Attention is called to the market report which follows.

MINERAL SPRINGS AND HEALTH RESORTS.

Tourists resort to California for both health and pleasure. The pleasure resorts are sufficiently advertised. Yosemite and the sequoia groves have been described, and their fame is known the world over. Coronado, Del Monte, Castle Crag, and the Raymond hotels are household words. But the mineral springs have scarcely been named

outside the State. The therapeutical action of mineral waters on the human system is well recognized by the medical faculty. No State possesses a greater variety or number of springs than California, and in the main they are accessible directly by rail or by a few miles of easy staging. It is needless to say that the climate is all that the invalid could desire. They are generally in the mountains, at elevations varying from 500 to 3,000 feet above the sea. Trout streams are in the vicinity and game abounds in the woods, so that the visitor may not suffer from *ennui* and may have an object to prompt to the exercise so essential to the recovery of health.

Dr. Winslow Anderson, of the "Pacific Medical Journal," has examined the springs of California and reported the results in a work published in 1890, from which these facts are taken. He found springs which may be classed as follows: thermal acid, alkaline, alum, arsenic, borax, bromine and bromide, calcareous, carbonated, chalybeate, chlorinated, iodine, magnesian, silicious, and sulphuretted. Thermal springs abound. He examined 290 springs. Many of these springs are known by some popular name, but which are really a group of springs, both hot and cold, and each containing different mineral constituents. A majority of the springs were subjected to quantitative analysis, so that the physician may now direct the patient to the spring which contains the specific remedy. Comparisons have been made with the waters of the celebrated springs of Europe and the ingredients found almost identical. Nearly every county, except the valley counties, contains mineral springs of known repute.

MARKET QUOTATIONS.

The following are the prices for provisions in California, on June 15, 1893. The first are the prices in San Francisco. The second are the retail prices at Sacramento City:

SAN FRANCISCO.

The quotations for provisions, such as meat and flour, are jobbing prices; all others are prices received by producers.

FLOUR—Family Extra, \$4 10@4 20 ¢ bbl; Bakers' Extra, \$4@4 20; Superfine, \$2 80@3 20.

WHEAT—\$1 20@1 22½ ¢ ctl for fair to choice Shipping; Milling grades, \$1 27½@1 35 ¢ ctl.

BARLEY—Feed, 82½@83¾ ¢ ctl, good quality, and 85c for choice; Brewing, 90c@1 02½.

OATS—Milling, \$1 60@1 65; fancy feed, \$1 60@1 65; good to choice, \$1 45@1 60; common to fair, \$1 15@1 35; Gray, \$1 30@1 45; Black, \$1 15@1 30 ¢ ctl.

CORN—Large Yellow, \$1 02½@1 05; Small Yellow, \$1 05@1 07½; White, \$1 10@1 17½ ¢ ctl.

CRACKED CORN—\$24@25 ¢ ton.

OILCAKE MEAL—\$35 ¢ ton.

CORNMEAL—Millers quote feed at \$23 50@24 50 ¢ ton; fine kinds for the table, in large and small packages, 2¾@3½ ¢ ¢ lb.

CHOPPED FEED—\$16 50@18 50 ¢ ton.

MIDDLINGS—\$20@22 50 ¢ ton.

HAY—New: Wheat, \$9@11 50; Wheat and Oat, \$8@9; Wild Oat, \$8@8 50; Alfalfa, \$8@10; Barley, \$7@8 ¢ ton.

STRAW—35@45 ¢ bale.

HOPS—13@16 ¢ lb.

MILLSTUFFS—Rye Flour, 3½ ¢; Rye Meal, 3c; Graham Flour, 3c; Oatmeal, 4½ ¢; Oat Groats, 5c; Cracked Wheat, 3½ ¢; Buckwheat Flour, 5c; Pearl Barley, 4¼@4½ ¢ lb.

BRAN—\$16 50@17 ¢ ton.

RYE—\$1 12½@1 15 ¢ ctl.

BUCKWHEAT—\$2 25 ¢ ctl.

GROUND BARLEY—\$19@19 50 ¢ ton.

POTATOES—Ordinary kinds of new sell in sacks at 90c@\$1 25 ¢ ctl. New Early Rose, bxs, 90c@\$1 25; New Burbanks, \$1@1 50 ¢ ctl.

ONIONS—Red, 75@85c; Silverskins, 90c@\$1 ¢ ctl.

DRIED PEAS—Green, \$1 75@2; Blackeye, \$1 65@1 75; Niles, \$2@2 25 ¢ ctl.

BEANS—Bayos, \$2 75@2 80; Butter, \$3@3 25; Pink, \$2 80@2 90; Red, \$3@3 25; Lima, \$2 90@3;

Pea, \$2 70@2 80; Small White, \$2 60@2 70; Large White, \$2 60@2 70 ¢ ctl.

VEGETABLES—Green Corn, 25@35 ¢ doz; String Beans, 2@4 ¢ lb; Wax Beans, 4@5c; Refugee Beans, 5@6c; Summer Squash, 75c@\$1 75 ¢ box; Cucumbers, 75c ¢ box for ordinary and \$2@2 50 ¢ box for bay; Green Peppers, 10@12c ¢ lb; Green Peas, \$1@1 50 ¢ sack; Asparagus, \$1 25@1 50 ¢ box for No. 1 and 50c@\$1 ¢ box for No. 2; Rhubarb, 40@75c ¢ box; Tomatoes, \$2@2 50 ¢ box; Turnips, \$1 ¢ ctl; Beets, \$1@1 25 ¢ sack; Carrots, 85c@\$1 25; Cabbage, \$1@1 15; Garlic, 1½@2c ¢ lb; Cauliflower, 65@85c ¢ doz; Dry Peppers, 5c ¢ lb; Dry Okra, 15c ¢ lb.

FRESH FRUIT—Apples, 25@50c ¢ box; Pears, 50@75c ¢ box and basket; Strawberries, \$5@8 ¢ chest for Sharpless and \$8@15 for Longworth; Raspberries, \$6@10 ¢ chest; Gooseberries, 2½@5c ¢ lb; Cherries, 25@40c for white, 50@60c for Royal Ann, and 25@45c ¢ box for black; Cherries in bulk, 2@3c ¢ lb; do. sour, 2c ¢ lb; Currants, \$4@5 50 ¢ chest; Royal Apricots, 90c@\$1 25 ¢ box; Moorpark Apricots, \$1@1 25 ¢ box; Figs, 15@20c ¢ lb; Cherry Plums, 50@75c ¢ drawer; Peaches, \$1@1 50 ¢ box; Blackberries, 75c ¢ drawer.

DRIED FRUIT—Apples, sliced, 7@7½ ¢; do. evaporated, in boxes, 8½@10c; Pears, bleached, 5@6c for sliced, 3@5c for quartered, and 8c for evaporated; Pears, unbleached, 3@4c for sliced, and 2½@3c for quartered; Figs, 4@5c for pressed, and 3@3½ ¢ for unpressed; Prunes, 7@8c for small, 9@9½ ¢ for the four sizes; and 10c for the fifth size of 50s@60s; pitted Plums, 8½@9½ ¢; unpitted, 2½@5c; bleached Peaches, 8½@10c; sundried, 7@8½ ¢; Apricots, 11@14c for Royal, and 14@15c for Moorpark; Grapes, 2@3½ ¢ lb.

NUTS—Chestnuts, 7@10c; Walnuts, 6@7c for hard shell; Chile Walnuts, 6c; California Almonds, 15c for soft shell; 6½@7½ ¢ for hard shell, and 15@16c for paper shell ¢ lb.

HONEY—Comb, 12@13c; amber, extracted, 5@6c; water white, extracted, 6@6½ ¢ lb.

BUTTER—Fancy creamery, 20@21c; fancy dairy, 19@20c; good to choice, 17@18½ ¢; common grades, 14@16c ¢ lb.

CHEESE—Choice to fancy, new, 8@9c; fair to

good, 7@7½c; Eastern, ordinary to fine, 11@13c; do. fancy creamery, 14@15c $\frac{1}{2}$ lb.

EGGS—California ranch, 20@22c; store lots, 15@17½c $\frac{1}{2}$ dozen; Eastern Eggs, 15@16c for fair, and 17½@18½c $\frac{1}{2}$ dozen for choice.

POULTRY—Live Turkeys—Gobblers, 14@15c $\frac{1}{2}$ lb; Hens, 13@14c; Roosters, \$5@6 for old, and \$8@10 for young; Friers, \$6@7 50; Broilers, \$2@3 for small, and \$4@5 50 for large; Hens, \$6@6 50; Ducks, old, \$4@4 50; young, \$4@5 $\frac{1}{2}$ dozen; Geese, old, \$1 25; Goslings, \$1 25@1 75 $\frac{1}{2}$ pair.

PROVISIONS—Eastern Hams, 16@16½c; California Hams, 15@15½c; Eastern Breakfast Bacon, 16@17c; California Bacon, heavy and medium, 13½c; do. light, 14@15c; do. extra light, 15½@16c $\frac{1}{2}$ lb; Pork, extra prime, \$16@16 50; do. prime mess, \$17@18; do. mess, \$23@24; do. clear, \$25@26; do. extra clear, \$26@27 $\frac{1}{2}$ bbl; Beef, mess, bbl, \$7 50@8; do. extra mess, bbls, \$8 50@9; do. family, \$11@12 $\frac{1}{2}$ bbl; extra do., \$12 50@13 $\frac{1}{2}$ bbl; do. smoked, 10½@11c; Eastern Lard, tierces, 10@10½c; do. prime steam, 13c; 10-lb pails, 14c; 5-lb, 14½c; 3-lb, 14¼c; California, 10-lb tins, 12@12½c; do. 5-lb, 12½@13c; do. kegs, 13½c; do. 20-lb buckets, 13c; compound, 9½c for tierces, and 10c $\frac{1}{2}$ lb for half bbls.

Meat Market.—Following are the rates for whole carcasses from slaughterers to dealers:

BEEF—First quality, 5½@6c; second quality, 4½@5c; third quality, 3½@4c $\frac{1}{2}$ lb.

CALVES—5@7c $\frac{1}{2}$ lb.

MUTTON—6@6½c $\frac{1}{2}$ lb.

LAMB—Spring, 7½@8½c $\frac{1}{2}$ lb.

PORK—Live Hogs, on foot, grain-fed, heavy and medium, 6½@6¾c; stock Hogs, 5¾@6c; dressed Hogs, 9½@9¾c $\frac{1}{2}$ lb.

SACRAMENTO CITY.

Retail Prices.—Following are the prices asked by retailers for the various articles mentioned:

GREEN FRUIT—Strawberries, 10c $\frac{1}{2}$ lb; Gooseberries, 8c $\frac{1}{2}$ lb; Cherries, Royal Ann, \$1 15 $\frac{1}{2}$ box; Sour, 50c $\frac{1}{2}$ box; Black, 65c $\frac{1}{2}$ box; Wild Blackberries, 10@12½c $\frac{1}{2}$ lb; Raspberries, 10c $\frac{1}{2}$ lb; Currants, 50c $\frac{1}{2}$ box; Apricots, Pringle, 10c $\frac{1}{2}$ lb; do. Royal, 12½c.

DRIED FRUIT—Apricots, 10@12c $\frac{1}{2}$ lb; Apples, 8@10c; Peaches, 12@16c; Plums, 12@14c; Prunes, 8@10c; Pears, 7@9c; Nectarines, 12@16c; Grapes, \$1 $\frac{1}{2}$ box; Figs, 5@8c $\frac{1}{2}$ lb.

CITRUS FRUITS—Limes, Mexican, 10c $\frac{1}{2}$ doz; Lemons, Sicily, 40c $\frac{1}{2}$ doz; California Lemons, 25c; Oranges, 15c $\frac{1}{2}$ doz; Cocoanuts, 10c each; Pineapples, 50c each; Bananas, 35c $\frac{1}{2}$ doz.

DAIRY PRODUCE—Butter—Valley, $\frac{1}{2}$ roll, 40c; Fancy Petaluma, 50c; Nevada Creamery, 50c; Eastern, packed, 20c $\frac{1}{2}$ lb; Firkin, 10@20c. Cheese—California, 15c $\frac{1}{2}$ lb; Young America, 16c; Eastern Creamery, 20c; Limburger, 20c; Genuine Swiss, 40c; American, 25c; Martin's Creamery, 20c.

EGGS—Fresh Ranch, 25c $\frac{1}{2}$ doz; two doz, 45c.

POULTRY—Turkeys—Live, 20c $\frac{1}{2}$ lb; Gobblers, 20c; dressed, 24c. Chickens—Hens, \$6@6 50 $\frac{1}{2}$ doz, 60@75c each; Roosters, \$6@7 $\frac{1}{2}$ doz, 60@75c each; Broilers, \$5 $\frac{1}{2}$ doz, 50@60c each; Tame Ducks, \$9 $\frac{1}{2}$ doz, 90c each; Geese, \$1 35 each.

VEGETABLES—Turnips, 12½c $\frac{1}{2}$ doz; Beets, 12½c; Carrots, 12½c; Parsnips, 12½c; Lettuce, 12½c; Radishes, 12½c; Cabbage, 1@1½c $\frac{1}{2}$ lb; Cauliflower, 10c; Green Onions, 12½c $\frac{1}{2}$ doz; Onions, 1½c $\frac{1}{2}$ lb; Dried Peppers, 20c; Garlic, 10c;

Horseradish Root, 10c; Spinach, 5c; Green Peas, 5@7c; Green Peppers, 25c; Dried Okra, 30c; Rhubarb, 5@7c; Celery, 5@10c $\frac{1}{2}$ bunch; Asparagus, 5c $\frac{1}{2}$ lb; Cucumbers, 20c $\frac{1}{2}$ doz; Artichokes, 5c $\frac{1}{2}$ doz; String Beans, 5c $\frac{1}{2}$ lb; Squash, 4c $\frac{1}{2}$ lb; Green Corn, 30c $\frac{1}{2}$ doz; Wax Beans, 5c $\frac{1}{2}$ lb; Tomatoes, 12½@15c.

POTATOES—New retail at 1½c $\frac{1}{2}$ lb.

MEATS—Beef—Prime Rib Roasts, 12½@15c; Chuck Roasts, 10c; Rump, 8c; Brisket, 8c; Corned Beef, 8c; Porterhouse Steak, 15@18c; Loin Steak, 12½@15c; Round Steak, 10c; Chuck, 10c. Veal—Loin and Rib Chops, 15c; Roast Veal, 12½c. Mutton—Leg, 11@12½c; Loin and Rib Chops, 12½c; Mutton Stew, 8c; Shoulder Chops, 8c. Pork—Roast or Chops, 15c; Corned Pork, 15c; Sausages, 12½c; Bacon, 14@19c; Ham, 16@20c.

BREADSTUFFS—Flour, \$4 40 $\frac{1}{2}$ bbl, \$1 10 for 50-lb sacks, \$2 20 for 100-lb sacks; Oatmeal, 10-lb sacks, 40c; Cornmeal, 10-lb sacks, 25c; Cracked Wheat, 10-lb sacks, 35c; Hominy, 10-lb sacks, 40c; Graham Flour, 10-lb sacks, 30c; Buckwheat, 10-lb sacks, 50c; Rye, 35c $\frac{1}{2}$ 10-lb sack.

HAY AND GRAIN—Hay, Oat, 65c $\frac{1}{2}$ cwt; Wheat, 65c; second quality, 55c; Alfalfa, 60c; Wheat, whole, \$1 55; Ground Barley, \$1 10; Feed Oats, \$1 60@1 85; Middlings, \$1 15; Bran, 95c; Straw, 70@75c $\frac{1}{2}$ bale.

Rates to Producers.—Following are the prices to producers of the various articles:

GREEN FRUIT—Strawberries, \$1 25 $\frac{1}{2}$ chest; Gooseberries, 5@6c $\frac{1}{2}$ lb; Cherries, Royal Ann, 90c $\frac{1}{2}$ box; black, 50c; Sour, 40c; Wild Blackberries, 8@10c $\frac{1}{2}$ lb; Raspberries, \$1 $\frac{1}{2}$ case; Currants, 40c $\frac{1}{2}$ box; Apricots, \$1 50 $\frac{1}{2}$ box.

DRIED FRUIT—Apricots, 6@7c $\frac{1}{2}$ lb; Peaches, 9@10c; Apples, 5@8c; Prunes, 9@10c; Pears, 4@5c; Nectarines, 7@8c; Raisins, \$1 50 $\frac{1}{2}$ box; Figs, 7c; Grapes, 7c $\frac{1}{2}$ lb.

DAIRY PRODUCE—Butter—Valley, 17½c $\frac{1}{2}$ lb; Fancy Petaluma, 19c; Nevada Creamery, 21c; Firkin, 15@17½c. Cheese—California, 10c; Young America, 11c; Eastern Creamery, 15@16c; Limburger, 17@18c; Genuine Swiss, 28c; American Swiss, 16@18c; Martin's Creamery, 15@16c.

EGGS—Ranch, 19@20c $\frac{1}{2}$ dozen.

POULTRY—Turkeys—Live Hens, 16c $\frac{1}{2}$ lb; Gobblers, 15c; dressed, 18c. Chickens—Hens, \$6@7 $\frac{1}{2}$ dozen; Roosters, \$5@6; Broilers, \$3; Tame Ducks, \$6 50; Geese, \$2 $\frac{1}{2}$ pair.

VEGETABLES—Yellow Squash, 2½c $\frac{1}{2}$ lb; Scallop do, 2½c; Wax Beans, 3½c; String, 3½c; Horse, 2c; Sacramento Peas, 3c; Alameda, 5c; Garlic, 7c; White Onions, 80c $\frac{1}{2}$ ctl; Red, 70c; Cabbage, Early York, ½c; Dutch, ¾c; Green Peppers, 15c; Dry, 12½c; Cucumbers, 15c $\frac{1}{2}$ doz; Green Corn, 20c $\frac{1}{2}$ doz; Tomatoes, 10c $\frac{1}{2}$ lb; Asparagus, \$1 $\frac{1}{2}$ box; Artichokes, 25c $\frac{1}{2}$ doz; Lettuce, 8c; Beets, 8c; Turnips, 8c; Carrots, 8c; Parsnips, 8c; Radishes, 8c; Green Onions, 8c.

POTATOES—New, \$1 $\frac{1}{2}$ ctl.

MEATS—Beef, 5½@6c $\frac{1}{2}$ lb; Mutton, 7½@8c; Lamb, 8@9c; Veal, large, 5@5½c; small, dressed, 8@9c; Hogs, 5½@6¼c; dressed Pork, 9c; Hams, Eastern, 17@20c; California, 15@17c; Bacon, 12½@17c.

BREADSTUFFS—Flour, \$4 $\frac{1}{2}$ bbl; Oatmeal, 10-lb sacks, 3½c $\frac{1}{2}$ lb, \$3 85 $\frac{1}{2}$ 100-lb sacks; Cornmeal, White, \$1 90 $\frac{1}{2}$ 100-lb sacks; Yellow, \$1 60 $\frac{1}{2}$ 100-lb sacks; Cracked Wheat, \$2 35 $\frac{1}{2}$ 100-lb sacks; Graham, \$2 $\frac{1}{2}$ 100-lb sacks.

HAY AND GRAIN—Oat Hay, \$10@11 $\frac{1}{2}$ ton; Wheat, \$10@11; second quality, \$9; Alfalfa, \$9@10 50; Wheat, whole, \$1 40 $\frac{1}{2}$ ctl; Barley, 95c; Corn, \$1 25; Bran, \$16 50 $\frac{1}{2}$ ton; Middlings, \$21 $\frac{1}{2}$ ton; Ground Barley \$22 $\frac{1}{2}$ ton; Straw, 50@55c $\frac{1}{2}$ bale.



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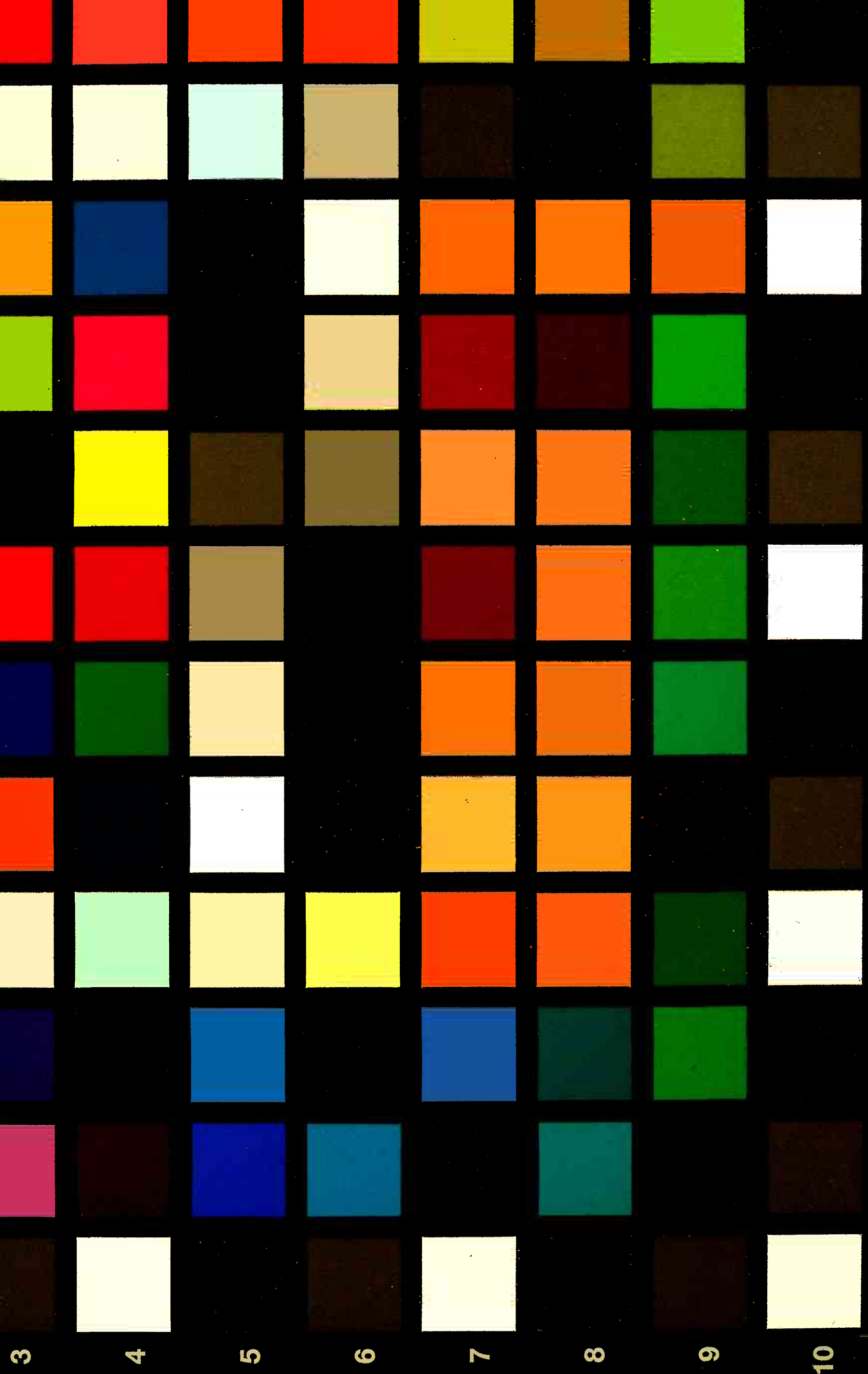
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